California Environmental Protection Agency

Air Resources Board

LOCATION:
California Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

This facility is accessible by public transit. For transit information, call (650) 992-2278 /(BART), website: http://www.bart.gov or (415) 673-6864 (MUNI)
(This facility is accessible to persons with disabilities.)

PUBLIC MEETING AGENDA

REVISED

November 16, 2006
9:00 a.m.

Item #

06-10-1: Report to the Board on a Health Update: Cancer Risk from Air Pollutants in a Population of Inner-City Teenagers

The investigators collected personal, indoor home and outdoor home samples of air pollutants from 86 teenagers and calculated their cancer risk from the personal concentration measurements. The cumulative cancer risk from personal exposure was greater than the risks from ambient exposures. The results are due in part to indoor home sources, which accounted for greater than 40% of the risk for compounds that were the major contributors of personal risk. These include formaldehyde, acetaldehyde, and chloroform.

06-10-2: Public Hearing to Consider 8 Research Proposals

"Investigation of the Role Lubricating Oil on Particulate Matter Emissions from Vehicles," Southwest Research Institute, $832,000, ARB co-funding will be $100,000, Proposal No. 2616-253.

"Analysis of Satellite Measurements to Improve California's Models for O_3 and PM," University of California, Berkeley, $350,724, Proposal No. 2618-253.

"Flux Measurements of Biogenic Precursors to Ozone and Particulate Matter in the Central Valley," University of California, Berkeley, $400,003, Proposal No. 2612-253.

"Development of the UCB-L Particle Monitor for California Applications in Environmental Justice," University of California, Berkeley, $213,088, Proposal No. 2613-253.

"Development of Updated ARB Solvent Cleaning Emissions Inventory," University of California, Riverside, $199,342, Proposal No. 2619-253.

"Lifecycle Analysis of the Climate-Change Reduction Strategies of the California Air Resources Board," University of California, Davis, $199,561.29, Proposal No. 2614-253.

"Impact of Climate Change on the Frequency and Intensity of Low-level Temperature Inversions in California," University of California, San Diego, $249,989, Proposal No. 2615-253.

"Deployment of a Novel Aerosol Mobility/Mass Spectrometer for Quantitative Chemical Analysis of Organic Aerosols from Mobile Sources," University of Southern California, $238,383, Proposal No. 2620-253.

06-10-3: Public Meeting to Update the Board on the ARB Emission Reduction Plan for Ports and Goods Movement in California

Staff will provide an update on progress made in implementing the Emission Reduction Plan for Ports and Goods Movement in California (Plan), including: rulemakings and other activities to reduce emissions, public outreach, additional risk assessments, and the status of funding mechanisms. The update will also describe staff's actions to revise the relationship used in the Plan and ARB's diesel rulemakings to estimate the contribution of fine particulate matter pollution to premature death, based on additional health analyses and scientific peer review.

06-10-4: Public Hearing to Consider the Proposed Adoption of Airborne Toxic Control Measure Amendments Limiting Onboard Incineration on Cruise Ships and Oceangoing Ships

The purpose of this control measure is to reduce emissions of toxic air contaminants from the use of incinerators aboard cruise ships and oceangoing ships. Specifically, this regulation prohibits cruise ships and oceangoing ships from conducting onboard incineration while operating within three miles of the California coast. This control measure is expected to reduce exposure to toxic air contaminants for residents living near ports and along the California coast.

06-10-5: Public Hearing to Consider Proposed Amendments to the Stationary Diesel Engine Control Measure

ARB staff is proposing emission performance standards for in-use stationary diesel agricultural engines. These emission standards may be met by a variety of compliance options, including electrification and replacement with new engines. The proposed amendments also include provisions for local air district agricultural engine registration programs. The proposed amendments are expected to reduce diesel PM and other air pollutant emissions, exposure, and health risk across California.

06-10-6: Public Hearing to Consider Proposed Amendments to the AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Regulation

The Guidelines Regulation provides guidelines for reporting emissions from facilities subject to the Air Toxics "Hot Spots" Information and Assistance Act of 1987. Proposed amendments will streamline the requirements for facilities with only diesel engines.

06-10-7: Public Hearing to Consider Proposed Amendments to the Area Designations for State Ambient Air Quality Standards

Based on a review of air quality data for 2003-2005, staff is proposing several changes to the State area designations for carbon monoxide, ozone, PM10, and PM2.5.

November 17, 2006
8:30 a.m.

06-8-3: **(THIS ITEM IS BEING RECALENDARED FOR DECEMBER 7, 2006)**
CONTINUATION FROM THE SEPTEMBER 28 BOARD MEETING*: Public Hearing to Consider Proposed Amendments to the Chromium Plating Regulation*

The staff is proposing amendments to the Chromium Plating ATCM to reduce the cancer risk posed by hexavalent chromium emissions. Hexavalent chromium is a human carcinogen. The proposed amendments would phase-in best available control technology to reduce hexavalent chromium emissions from chromium plating and chromic acid anodizing facilities.

06-10-8: **Public Hearing to Consider Proposed Amendments to the California Consumer Products Regulations**

The proposed regulatory action would amend the existing Consumer Products Regulation by establishing new Volatile Organic Compound limits for 16 product categories. Changes are also being proposed to the Aerosol Coatings Regulation to clarify product applicability.

OPPORTUNITY FOR MEMBERS OF THE BOARD TO COMMENT ON MATTERS OF INTEREST.

Board members may identify matters they would like to have noticed for consideration at future meetings and comment on topics of interest; no formal action on these topics will be taken without further notice.

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 three minutes to ensure that everyone has a chance to speak.

TO SUBMIT WRITTEN COMMENTS ON AN AGENDA ITEM IN ADVANCE OF THE MEETING GO TO:
http://www.arb.ca.gov/lispub/comm/bclist.php

IF YOU HAVE ANY QUESTIONS,
PLEASE 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

To request special accommodation or language needs, please contact the following:

- **For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services.**
- **If you are a person with limited English and would like to request interpreter services to be available at the Board meeting, please contact ARB's Bilingual Manager at 916-323-7053.**

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

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

California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

LOCATION:
Air Resources Board
Byron Sher Auditorium, Second Floor
1001 I Street
Sacramento, California 95814

This facility is accessible by public transit. For transit information, call (916) 321-BUSS, website: http://www.sacrt.com
(This facility is accessible to persons with disabilities.)

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November 16 & 17, 2006
9:00 a.m.

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TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER THE PROPOSED ADOPTION OF AIRBORNE TOXIC CONTROL MEASURE AMENDMENTS LIMITING ONBOARD INCINERATION ON CRUISE SHIPS AND OCEANGOING SHIPS

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider the adoption of proposed Airborne Toxic Control Measure (ATCM) amendments regarding onboard incineration on cruise ships and other oceangoing ships at California ports and terminals and along the California coast.

DATE: November 16, 2006

TIME: 9:00 a.m

PLACE: Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m. on Thursday, November 16, 2006, and may continue at 8:30 a.m., Friday, November 17, 2006. This item may not be considered until November 17, 2006. Please consult the agenda for the meeting, which will be available at least ten days before November 16, 2006, to determine the day on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at (916) 323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at (916) 323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendment to title 17, California Code of Regulations (CCR) section 93119.

Background:

In October 2004, Assembly Bill 471 (AB 471) was passed by the California Legislature and codified in Health and Safety Code (HSC) section 39630-39632. AB 471 prohibited cruise ships from conducting onboard incineration while operating within three miles of the California coast. On November 17, 2005, the Board adopted the ATCM for Cruise Ship Onboard Incineration (Cruise Ship ATCM) as title 17, CCR, 93113. The Cruise Ship ATCM implements AB 471 by clarifying the limit for incineration along the

California coast as three nautical miles and establishing recordkeeping and reporting requirements.

In October 2005, the California Legislature enacted Senate Bill 771 (SB 771), which amended HSC sections 39630-39632. SB 771 expands the requirements of AB 471 to include all oceangoing ships of 300 gross registered tons or more. This law became effective January 1, 2006.

Description of the Proposed Regulatory Action:

ARB staff is proposing that the Board amend the Cruise Ship ATCM to incorporate the requirements of SB 771, further limit the definition of "cruise ship" to those calling on California ports or places, refine the recordkeeping requirements, including requirements for cruise ships, require that information be recorded while ships are operating within Regulated California Waters (RCW) as defined, and add alternative requirements for the military for recordkeeping and onboard inspections. The proposed amendments are expected to reduce public exposure to emissions of toxic air contaminants (TACs) for residents and workers living or working in port communities and along the California coast.

The proposed amended ATCM would affect owners or operators of cruise ships and oceangoing ships calling on California ports or places. As defined in HSC section 39631 and the proposed regulatory amendments, an oceangoing ship is a private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places, excluding cruise ships.

Cruise ship and oceangoing ship owners and operators would be prohibited from conducting onboard incineration within three nautical miles of the California coast. However, onboard incineration within three nautical miles of the California coast may be permitted when operated under the direction and supervision of the United States Coast Guard (USCG). Under existing USCG policy, during port inspections, USCG personnel may require an owner or operator of a cruise ship or oceangoing ship to operate the incinerator as a means to verify the incinerator is in proper working order.

Under the existing Cruise Ship ATCM, cruise ship owners or operators are required to maintain incineration records for each segment of a voyage, if during any portion of that segment the cruise ship travels within three miles of the California coast. The proposed amendments modify this provision to require cruise ship and oceangoing ship owners or operators to record certain information while operating in RCW. In Northern and Central California, the RCW boundary follows the 24 nautical mile contiguous zone, an internationally recognized boundary. In Southern California, the boundary consists of straight line segments approximately 24 nautical miles offshore of the coastline.

The following information would have to be recorded by the cruise ship and oceangoing ship owner or operator while the incinerator is operating within the RCW:

- The date and time of start and stop of incineration (in local time);
- The position of the ship in latitude and longitude for each start and stop time of incineration;
- The estimated amount incinerated in cubic meters (m^3);
- The name or signature of officer in charge of the operation; and
- When operation of the incinerator is required by the USCG, the name, unit, and phone number of USCG personnel who directed that the incinerator be operated.

Records would have to be maintained in English and kept onboard the ship for two years. During an onboard inspection, these records must be made available to ARB personnel, or their delegates. In addition, upon written request by ARB's Executive Officer, the owner or operator of the ship must provide copies of the records within 30 calendar days of the request.

With the exception of the requirement to record the name, unit, and phone number of USCG personnel who directed operation of the incinerator, the recordkeeping requirements in the proposed amended ATCM are also required under Regulation 9 of Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78). Cruise ships and oceangoing ships of 400 gross registered tons or more currently maintain this information in a garbage record log book. The additional requirement to record the name, unit, and phone number of USCG personnel who directed operation of the incinerator will avoid penalizing the cruise ship or oceangoing ship owner or operator for a permissible activity and will allow ARB a means to verify compliance with the ATCM.

Due to heightened national security and military security concerns, clearance issues could arise for ARB inspectors to board military vessels. Therefore, alternative requirements are proposed for military agencies to address special issues of onboard inspections for military vessels.

As specified in MARPOL 73, Article 3, in certain situations, MARPOL 73 requirements do not apply to military vessels. However, owners or operators of military vessels are required to "...ensure by the adoption of appropriate measures not impairing the operations or operational capabilities of such ships owned or operated by it, that such ships act in a manner consistent, so far as is reasonable and practicable, with the present Convention." Therefore, alternative requirements are proposed for military agencies to address these special recordkeeping issues.

Under the proposed amended ATCM, cruise ship and oceangoing ship owners or operators are prohibited from conducting onboard incineration within three miles of the California coast, except when required to be operated under the direction or supervision of the USCG. The phrase "within three miles of the California coast" is defined in the existing ATCM as between the California coast and the Three Nautical Mile Line, as

shown on the following National Oceanic and Atmospheric Administration (NOAA) Nautical Charts, as authored by the NOAA Office of Coast Survey, which are incorporated by reference in the proposed amended regulation.

- Chart 18600, Trinidad Head to Cape Blanco (January 2002);
- Chart 18620, Point Arena to Trinidad Head (June 2002);
- Chart 18640, San Francisco to Point Arena (August 2005);
- Chart 18680, Point Sur to San Francisco (June 2005);
- Chart 18700, Point Conception to Point Sur (July 2003);
- Chart 18720, Point Dume to Purisima Point (January 2005); and
- Chart 18740, San Diego to Santa Rosa Island (April 2005)

COMPARABLE FEDERAL REGULATIONS

The International Maritime Organization (IMO) is a specialized agency of the United Nations which is responsible for measures to improve the safety and security of international shipping and to prevent marine pollution from ships. The IMO, along with other maritime nations, has developed standards which are set forth in MARPOL 73/78. MARPOL 73/78 is a combination of two treaties adopted in 1973 and 1978 and has been updated by amendments over the years. MARPOL 73/78 includes six technical annexes which include regulations aimed at preventing and minimizing pollution from ships. Compliance with MARPOL 73/78 is mandatory.

MARPOL 73/78 contains two regulations for onboard cruise ship and oceangoing ship incinerators. Annex V primarily deals with garbage recordkeeping requirements for onboard incineration. Annex VI prohibits the incineration of certain wastes and imposes additional operating requirements for the incinerators. MARPOL 73/78 is implemented in the United States by the Act to Prevent Pollution from Ships (33 U.S.C. section 1901 *et seq.*). The USCG is responsible for prescribing and enforcing regulations pursuant to MARPOL 73/78. The recordkeeping requirements in the proposed amended ATCM are not substantially different from the recordkeeping requirements of MARPOL 73/78. However, the recordkeeping requirements in the proposed amended ATCM differ from those in MARPOL 73/78 in that the proposed amended ATCM recognizes that under USCG policy, the USCG may direct an owner or operator of a cruise ship or oceangoing vessel to operate the incinerator within three nautical miles of the California coast. Therefore, the proposed amended ATCM also requires the cruise ship and oceangoing ship owner or operator to record the name, unit, and phone number of USCG personnel who directed operation of the incinerator.

The Animal and Plant Health Inspection Service (APHIS) in the U.S. Department of Agriculture is responsible for regulations and policies governing the handling and disposal of regulated garbage to prevent the introduction of foreign animal and plant disease and pests. These regulations are contained in title 7, Code of Federal Regulations (CFR), section 330.400 and title 9, CFR section 94.5. "Regulated garbage," as defined in the CFR, is derived in whole or in part from fruits, vegetables, meats, or other plants or animal material, and other refuse associated with the material

onboard including food scraps, table refuse, galley refuse, food wrappers or packing materials and other waste material from stores, food preparation areas, passenger or crew quarters, dining rooms and other areas. Most of the regulated garbage onboard cruise ships and oceangoing ships are subject to APHIS regulations.

Under APHIS regulations, regulated garbage within the territorial waters or the territory of the United States is required to be destroyed by incineration to an ash or sterilization by cooking to an internal temperature of 212 degrees Fahrenheit for 30 minutes. Regulated garbage may also be ground and disposed of in an APHIS approved sewer system.

The proposed amended ATCM differs from the APHIS regulations in that APHIS allows incineration within territorial waters (within 12 nautical miles of the coast) while the proposed amended ATCM prohibits incineration within three nautical miles of the California coast.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

ARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled, "Staff Report: Initial Statement of Reasons for the Proposed Adoption of Airborne Toxic Control Measure Amendments Limiting Onboard Incineration on Cruise Ships and Oceangoing Ships."

Copies of the ISOR and the full text of the proposed regulatory language may be accessed on the ARB's website 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 16, 2006).

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 website listed below.

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Robert Krieger, Manager of the Emissions Evaluation Section, Emissions Assessment Branch, Stationary Source Division at (916) 323-1202 and Michelle Komlenic, Air Pollution Specialist, Stationary Source Division at (916) 322-3926.

Further, the agency representative and designated back-up contact person to whom nonsubstantive inquiries concerning the proposed administrative action may be directed to Alexa Malik, Regulations Coordinator, (916) 322-4011. 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/csoi06/csoi06.htm*.

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the Executive Officer of the ARB 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.

The ARB's Executive Officer has determined that the proposed regulatory action will not create costs, as defined in Government Code section 11346.5(a)(6), to state agencies. Any such costs should be minimal, and affected state agencies should be able to absorb these costs within existing budgets and resources. Pursuant to Government Code section 11346.5(a)(5), the Executive Officer has also determined that the proposed regulatory action will not create costs or savings 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 cost or savings to state or local agencies.

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. ARB is not aware of any significant cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action. This is because HSC section 39632, enacted by AB 471 and SB 771, already prohibits onboard incineration on cruise ships and oceangoing ships (of 300 gross registered tons or more) while operating within three miles of the California Coast, and MARPOL 73/78 already requires maintenance of most records proposed to be required. The only additional recordkeeping requirement imposed by the proposed action is the additional information if the USCG directs the owner or operator of a cruise ship or oceangoing ship to operate the incinerator within Regulated California Waters. Therefore, recordkeeping costs from this regulation would be negligible.

Ships between 300 and 400 gross tons are not required to maintain records under MARPOL 73/78. However, as specified in HSC sections 39631-39632, the proposed amended Cruise Ship ATCM will apply to oceangoing vessels 300 gross registered tons or more. Although ARB staff did not identify any oceangoing vessels between 300 and 400 gross registered tons which conduct onboard incineration, under the proposed amendments, ships between 300 and 400 gross tons conducting onboard incineration could incur negligible costs for recordkeeping during the time the oceangoing ship is traveling in RCW.

Although in certain situations MARPOL 73 requirements do not apply to government agencies such as the military, they must still adopt appropriate measures that are

consistent with MARPOL. For some agencies it is not clear whether or not records are kept for onboard incineration. In the proposed amended Cruise Ship ATCM, alternative recordkeeping requirements are proposed for military agencies to track compliance. It is expected that costs would be negligible for recordkeeping.

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 not affect small businesses because the affected industry is composed of only large businesses.

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements of the ATCM 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, ARB 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 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 email before the hearing. To be considered by the Board, written submissions must be received **no later than 12:00 noon, November 15, 2006**, and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Facsimile submittal: (916) 322-3928

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 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 the authority granted to ARB in the HSC sections 39516, 39600, 39601, 39631, 39632, 39650, 39656, 39658, 39659, 39666, and 41510. This action is proposed to implement, interpret, and make specific HSC sections 39630, 39631, 39632, 39650, 39656, 39659, 39666, 41700, and 41806.

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 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, CA 95814, (916) 322-2990. The document will also be posted on the website listed above.

CALIFORNIA AIR RESOURCES BOARD

Catherine Witherspoon
Executive Officer

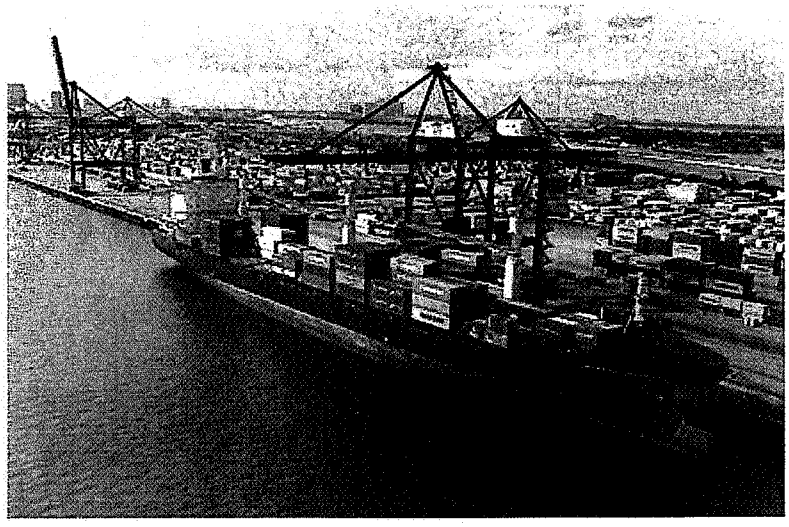
Date: September 19, 2006

California Environmental Protection Agency

Air Resources Board

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR THE PROPOSED ADOPTION OF AIRBORNE TOXIC CONTROL MEASURE AMENDMENTS LIMITING ONBOARD INCINERATION ON CRUISE SHIPS AND OCEANGOING SHIPS

Stationary Source Division
Emissions Assessment Branch



Release Date:
September 29, 2006

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

Public Hearing to Consider

PROPOSED ADOPTION OF AIRBORNE TOXIC CONTROL MEASURE AMENDMENTS LIMITING ONBOARD INCINERATION ON CRUISE SHIPS AND OCEANGOING SHIPS

To be considered by the Air Resources Board on November 16-17, 2006, at:

Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

Air Resources Board
P.O. Box 2815
Sacramento, California 95812

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State of California
AIR RESOURCES BOARD

PROPOSED ADOPTION OF AIRBORNE TOXIC CONTROL MEASURE AMENDMENTS LIMITING ONBOARD INCINERATION ON CRUISE SHIPS AND OCEANGOING SHIPS

Staff Report

Prepared by:

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Michele Houghton
Steven Yee

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Daniel E. Donohoue, Chief, Emissions Assessment Branch
Robert D. Barham, Ph.D., Assistant Chief, Stationary Source Division
Robert D. Fletcher, Chief, Stationary Source Division

September 29, 2006

ACKNOWLEDGMENTS

The ARB would like to acknowledge the assistance of the following individuals, agencies, and organizations for their participation and assistance:

Diane Kiyota, Office of Legal Affairs, ARB
Reza Mahdavi, Research Division, ARB
Terone Preston, Enforcement Division, ARB
Meredith Westington, Office of Coast Survey, NOAA
Teri Shore, Bluewater Network
Marykay Faryan, United States Navy
Randy Friedman, United States Navy
Sande George, Stefan George Associates
Joseph Sabel, United States Coast Guard
Paul Nguyen, URS Corporation

Staff Report: Initial Statement of Reasons for the Proposed Adoption of Airborne Toxic Control Measure Amendments Limiting Onboard Incineration on Cruise Ships And Oceangoing Ships

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State of California
AIR RESOURCES BOARD

Staff Report: Initial Statement of Reasons for the Proposed Adoption of Airborne Toxic Control Measure Amendments Limiting Onboard Incineration on Cruise Ships and Oceangoing Ships

Executive Summary

I. INTRODUCTION

In California, there has been growing concern over pollutants being emitted from marine vessels. Marine vessels can be a significant contributor of emissions at California ports and along the coast. The sources of these emissions include the exhaust from the main engines, diesel generators, auxiliary boilers, and incinerators. In an effort to reduce the emissions from incinerators onboard marine vessels, the California Legislature adopted legislation that applies to cruise ships and oceangoing ships which prohibits onboard incineration when they are within three miles of the California coast.

In October 2004, Assembly Bill 471 (AB 471) was passed by the California Legislature and codified in Health and Safety Code (HSC) section 39630 *et seq.* AB 471 prohibits cruise ships from conducting onboard incineration while operating within three (nautical) miles of the California coast. On November 17, 2005, the Air Resources Board (ARB/Board) adopted the Airborne Toxic Control for Measure for Cruise Ship Onboard Incineration (Cruise Ship ATCM). The Cruise Ship ATCM implements AB 471 by clarifying the three nautical mile limit for incineration along the California coast and establishing recordkeeping and reporting requirements.

In October 2005, Senate Bill 771 (SB 771) was passed by the California Legislature and codified in Health and Safety Code (HSC) section 39630 *et seq.* SB 771 expands the requirements of AB 471 to include oceangoing ships of 300 gross registered tons or more. An oceangoing ship is defined as a private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places. This law became effective January 1, 2006.

ARB staff is proposing to amend the Cruise Ship ATCM to incorporate the requirements of SB 771. With the proposed amendments, oceangoing ships will be prohibited from conducting onboard incineration within three nautical miles of the California coast. ARB staff estimates that about one percent of the 1,900 oceangoing ships that called on a California port in 2005 incinerated within three nautical miles of

the California coast (prior to January 1, 2006, the effective date for SB 771). To ensure compliance with the proposed amended ATCM, oceangoing ships must keep incineration records, similar to records already kept under MARPOL Annex V. Due to national security issues, military vessels do not keep records under MARPOL Annex V and the United States Coast Guard has exempted them from these recordkeeping requirements. Additionally, the United States Navy (including Military Sealift Command) has a policy which prohibits incineration within 12 nautical miles from the California coast and the United States Coast Guard has a policy which prohibits incineration within three nautical miles of the California coast. For these reasons, special recordkeeping requirements for owners or operators of military vessels are included in the proposed amended ATCM.

Costs to comply with the proposed amendments are negligible and ARB staff has determined that prohibiting incineration within the three nautical mile limit is sufficiently protective of public health.

The Cruise Ship ATCM and the proposed amendments are expected to reduce public exposure to emissions of toxic air contaminants (TACs) for residents and workers living or working in port communities and along the California coast.

II. BACKGROUND

1. Why is the staff proposing amendments to the ATCM for cruise ship onboard incineration?

Air pollution from oceangoing vessels is a significant and growing concern in California. In 2005, oceangoing ships (non-cruise ships) accounted for approximately 9,900 port calls in California. Emissions from onboard incineration can be a significant source of air pollution. By prohibiting incineration within three nautical miles of the California coast, the potential for adverse public health impacts will be reduced for residents and offsite (i.e., off-ship) workers who live or work near ports and along the coast. AB 471 and SB 771 state that the ARB shall enforce this legislation and may adopt standards, rules, and regulations for this purpose. ARB is proposing to amend the Cruise Ship ATCM to implement SB 771 and to ensure this law is adequately enforced. The proposed amended Cruise Ship ATCM is expected to reduce emissions from TACs such as polychlorinated dibenzo-*p*-dioxins (PCDDs or dioxins), polychlorinated dibenzofurans (PCDFs or furans), and toxic metals.

2. What are the current regulations for oceangoing ship onboard incineration?

Oceangoing ship onboard incinerators are subject to regulations set forth in the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78). In general terms, MARPOL 73/78 is the international treaty regulating disposal of wastes generated by normal operation of vessels. MARPOL 73/78 contains two regulations for onboard cruise ship incinerators:

Regulation 9 of Annex V of MARPOL 73/78 which primarily deals with garbage recordkeeping requirements for onboard incineration; and Annex VI which prohibits the incineration of certain wastes and imposes additional operating requirements for the incinerators. MARPOL 73/78 is implemented in the United States (U.S.) by the Act to Prevent Pollution from Ships (33 U.S.C. section 1901 *et seq.*). The United States Coast Guard (USCG) is responsible for prescribing and enforcing regulations pursuant to MARPOL 73/78.

The United States Department of Agriculture, Animal, and Plant Health Inspection Service (APHIS), is responsible for regulations and policies governing the handling and disposal of regulated garbage to prevent the introduction of foreign animal and plant diseases and pests. Garbage is regulated on oceangoing ships as a result of movements outside of the United States and certain other movements. Regulated garbage includes waste such as: vegetables, meats, food scraps, table refuse, galley refuse, food wrappers or packing materials and other waste material from stores, food preparation areas, passenger or crews quarters, dining rooms and other areas. Regulated garbage within the territorial waters or the territory of the United States is required to be destroyed by incineration to an ash or sterilization by cooking to an internal temperature of 212 degrees Fahrenheit for 30 minutes. Regulated garbage may also be ground and disposed of in an APHIS approved sewer system. Garbage on vessels that have not been outside the U.S. for the previous two years or have gone through an APHIS sanctioned "purging" process is not regulated.

There are currently no California regulations specific to oceangoing ship onboard incineration.

III. PUBLIC OUTREACH

An open public process that involves all parties affected by the proposed amended Cruise Ship ATCM is an important component of all of ARB's actions. As part of ARB's outreach program, staff made personal contacts with industry representatives, as well as other parties, through meetings, telephone calls, and electronic mail. Staff developed a workgroup consisting of industry and environmental group representatives. Staff held two workgroup meetings and conducted one public workshop.

IV. OCEANGOING SHIP ONBOARD INCINERATOR SURVEY

1. <u>What is the Oceangoing Ship Onboard Incinerator Survey and what were the results of the Survey?</u>

In May 2006, ARB sent out the Oceangoing Ship Onboard Incinerator Survey (Survey). The Survey requested oceangoing ship operators to gather and submit information to ARB on incinerator and waste handling practices. Information collected from the Survey included the amount and type of waste incinerated, the operating

schedule of the onboard incinerator(s), control equipment, and alternative waste treatment for onboard incineration.

The Survey results showed that prior to January 1, 2006, the effective date of SB 771, only 3 out of 395 vessels which responded to the Survey incinerated waste within three nautical miles of the California coast. For these three ships, the amount of waste incinerated within three nautical miles of the California coast (prior to January 1, 2006) made up less than 0.01 percent of each of these three ships' total waste.

The Survey also showed that about 56 percent of the oceangoing ships conduct onboard incineration. Although these ships incinerate a variety of wastes, the most common types of incinerated waste include paper products, rags, sludge and waste oil, oil filters, packing materials, and light plastics. On average, oceangoing ships operate their incinerator six hours per day two days per week. The Survey also showed that ships use other means to dispose of waste, such as disposal to port facilities, recycling, and disposal to sea in compliance with MARPOL 73/78 regulations. Incinerators onboard oceangoing ships are not equipped with air pollution control devices.

V. POTENTIAL HEALTH IMPACTS OF SUBSTANCES EMITTED FROM ONBOARD INCINERATION

1. What are the potential health impacts remaining after implementation of the proposed amended Cruise Ship ATCM?

The ARB staff conducted an evaluation of the potential health impacts from the proposed amended Cruise Ship ATCM. Because the standard (i.e., no incineration within three miles of the California coast) was already set forth in AB 471 and SB 771, staff focused its efforts on assessing the potential health risk remaining after implementation to ensure that it was adequately health protective. ARB staff conducted a qualitative assessment for oceangoing ships onboard incineration and compared it to the quantitative assessment conducted for cruise ships as previously evaluated in the *Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for Cruise Ship Onboard Incineration, September 30, 2005* (Cruise Ship Staff Report) (ARB, 2005a), which is incorporated herein by reference. Based on several factors, such as the significantly lower amounts of waste generated and incinerated onboard, smaller numbers of crew, limited operating times, and prohibitory company policies or military policies, ARB staff has determined that potential health impacts due to incineration onboard oceangoing vessels would be less than the potential health impacts from incineration onboard cruise ships.

In the Cruise Ship Staff Report, staff estimated potential cancer and noncancer health impacts from cruise ship onboard incineration. Based on the risk assessment results, the estimated potential cancer risk ranged from 0.6 to 1.9 chances per million. For noncancer health impacts, the hazard indices for acute and chronic impacts are less

than one. In general, a hazard index less than one is not a concern to public health. Based on this analysis, staff concluded that the three nautical mile limit for onboard incineration is sufficiently protective of public health.

VI. SUMMARY OF THE PROPOSED AMENDED CRUISE SHIP ATCM

1. Who is affected and what does the proposed amended Cruise Ship ATCM require?

The proposed amended Cruise Ship ATCM would affect owners or operators of cruise ships and oceangoing ships calling on California ports or places. An oceangoing ship is defined as a private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places. An oceangoing ship does not include a cruise ship.

Cruise ship owners or operators and oceangoing ship owners and operators are prohibited from conducting onboard incineration within three nautical miles of the California coast. However, onboard incineration within three nautical miles of the California coast may be permitted when operated under the direction and supervision of the USCG.

With the exception of military vessels, cruise ship and oceangoing ship owners or operators are required to keep incineration records while operating in Regulated California Waters (RCW). In Northern and Central California the RCW boundary follows the 24 nautical mile contiguous zone, an internationally recognized boundary. In Southern California, the boundary consists of straight line segments approximately 24 nautical miles offshore of the coastline. Military vessels are required to keep incineration records when operating within three nautical miles of the California coast.

The definition for "within three miles of the California coast" is defined as the Three Nautical Mile Line shown on official National Oceanic and Atmospheric Administration (NOAA) Nautical Charts. These charts have been incorporated by reference into the proposed ATCM.

2. What happens when the NOAA nautical charts are revised?

A nautical chart is a graphic portrayal of the marine environment showing the nature and form of the coast, the general configuration of the sea bottom (including water depths), locations of dangers to navigation, locations and characteristics of man-made aids to navigation, and other features useful to the mariner. NOAA periodically updates its charts to reflect changes to any of these features, including changes unrelated to the Three Nautical Mile Line. Staff is proposing that when NOAA updates its charts, the Executive Officer may revise the definition of "within three miles of the California coast" to incorporate the updated charts by publishing the revision in the California Notice Register, sending an electronic notice out to all subscribers of the oceangoing ship incineration list serve and cruise ship incineration list serve, posting to

the oceangoing ship incineration website at www.arb.ca.gov/toxics/shipincin/shipincin.htm, and notifying potentially affected cruise ship owners or operators at least 30 days before the updates take effect.

3. What are the key issues?

The military expressed concerns with onboard inspections. Currently, the military agencies, which conduct onboard incineration and call on California ports include the United States Navy (including Military Sealift Command) and the United States Coast Guard. Due to heightened national security, significant clearance issues could arise for ARB inspectors to board military vessels. Each military branch has established policies for onboard environmental inspections to preserve national security while not denying legitimate entry for inspection. Prior to onboard inspections, ARB inspectors would follow these policies and procedures for each applicable military branch. ARB staff recognizes that non-military vessels may also have security procedures in place to address onboard inspections. To the extent that these security procedures are necessary to preserve national security while not denying legitimate entry for inspection, ARB inspectors would also follow these procedures.

VII. ECONOMIC AND ENVIRONMENTAL IMPACTS OF THE PROPOSED ATCM

1. What will the proposed amended Cruise Ship ATCM cost?

The proposed amended Cruise Ship ATCM is not expected to result in any significant economic impacts and is not expected to cause a change in employment, business status, or competitiveness. ARB does not expect an impact on the creation or elimination of jobs, or the creation or elimination of oceangoing ships traveling to California.

ARB staff evaluated the cost impacts to local, state, and federal agencies and determined there are no significant economic impacts.

2. Are there any significant adverse environmental impacts associated with the proposed amended Cruise Ship ATCM?

ARB staff evaluated potential water quality impacts, potential increase in diesel emissions, diversion of waste to landfills and land-based municipal waste incinerators, and public health impacts from storing garbage. ARB staff has determined that no significant adverse environmental impacts are expected to occur.

ARB is committed to evaluating community impacts of proposed regulations, including environmental justice concerns. Because some communities experience higher exposure to toxic pollutants, it is a priority of ARB to ensure that full protection is afforded to all Californians. The proposed amended Cruise Ship ATCM will ensure that

Californians who live or work near ports or coastal areas are not negatively impacted by emissions from oceangoing ship onboard incinerators.

VIII. RECOMMENDATION

The ARB staff recommends that the Board adopt the proposed amended Cruise Ship ATCM. In order to implement and interpret State law (AB 471 and SB 771), staff is proposing amendments that prohibit oceangoing ships from incinerating within three nautical miles of the California coast. This proposed amended Cruise Ship ATCM incorporates oceangoing ships into the ATCM, clarifies the definition of "cruise ship," amends the recordkeeping requirements for cruise ships, adds recordkeeping requirements for oceangoing ships, and establishes special recordkeeping requirements for military vessels. Benefits from the proposed amended Cruise Ship ATCM are reduced public exposure to TACs for residents and off-site workers (i.e., off-ship) living or working near ports and along the California coast. Exposure to these TACs can cause cancer and noncancer health impacts.

I. INTRODUCTION

In California, there has been growing concern over pollutants being emitted from marine vessels. Marine vessels can be a significant contributor of emissions at California ports and along the coast. The sources of these emissions include the exhaust from the main engines, diesel generators, auxiliary boilers, and incinerators. In an effort to reduce the emissions from incinerators on marine vessels, the California Legislature has adopted legislation which prohibits incineration within three miles of the California coast.

In 2004, Assembly Bill 471 (AB 471) was passed by the California Legislature and codified in Health and Safety Code (HSC) section 39630 *et seq.* AB 471 prohibits cruise ships from conducting onboard incineration while operating within three (nautical) miles of the California coast. A cruise ship is defined as a commercial vessel that has berths or overnight accommodations for passengers and that has the capacity to carry 250 or more passengers for hire. This law became effective January 1, 2005. On November 17, 2005, the Air Resources Board (ARB/Board) adopted the Airborne Toxic Control for Measure for Cruise Ship Onboard Incineration (Cruise Ship ATCM). The Cruise Ship ATCM implements AB 471 by clarifying the three nautical mile limit for incineration along the California coast and establishing recordkeeping and reporting requirements. The Cruise Ship ATCM can be found on ARB's website at http://www.arb.ca.gov/toxics/shipincin/shipincin.htm.

In October 2005, Senate Bill 771 (SB 771) was passed by the California Legislature and codified in Health and Safety Code (HSC) section 39630 *et seq.* SB 771 expands the requirements of AB 471 to include oceangoing ships of 300 gross registered tons or more. An oceangoing ship is defined as a private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places (see Appendix E for a copy of the legislation). This law became effective January 1, 2006.

With this staff report, ARB staff is proposing to amend the Cruise Ship ATCM to implement SB 771 and to ensure that it is adequately enforced. The Cruise Ship ATCM and the proposed amendments are expected to reduce public exposure to emissions of toxic air contaminants (TACs) for residents and workers living or working in port communities and along the California coast. This report addresses emissions from incinerators onboard oceangoing ships only. If you would like more information on the Cruise Ship ATCM, see the ARB's report entitled *Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for Cruise Ship Onboard Incineration, September 30, 2005* (Cruise Ship Staff Report) (ARB, 2005a), which can be found on ARB's website at http://www.arb.ca.gov/toxics/shipincin/shipincin.htm and which is incorporated by reference herein.

II. BACKGROUND

As discussed in Chapter I, the proposed amendments incorporate oceangoing vessels into the Cruise Ship ATCM; therefore, our analysis in this staff report only considers oceangoing vessels (non-cruise ships). An analysis of cruise ships was conducted in 2005 and can be found in the Cruise Ship Staff Report (ARB, 2005a) on ARB's website at http://www.arb.ca.gov/toxics/shipincin/shipincin.htm.

A. Oceangoing Ship Industry in California

1. Types of Vessels that Call on California Ports

Several different types of vessels call on California ports. The most common types of oceangoing ships making port calls are container vessels. Container vessels carry standardized truck-size containers and account for almost one-half of the port calls in California. Tanker vessels, designed to transport liquids in bulk, have the second largest number of port calls, accounting for 22 percent of the port calls. Bulk carriers which transport dry cargoes, such as mineral ore, fertilizer, grains, and auto carriers account for ten and eight percent, respectively, of the port calls. General/Reefer vessels, accounting for about eight percent of the port calls, transport perishable commodities requiring temperature-controlled transportation, such as fruits, meats, vegetables, etc. Unmanned barges, usually moved by tugboats, account for five percent of port calls and typically transport heavy goods, such as rock. Other vessels, which account for less than one percent of the port calls, include vessels such as research, military, and tug vessels. Table II-1 shows a breakdown of the number of port calls and percentage of port calls by vessel type.

Table II-1.
2005 California Port Calls by Vessel Type[1,2]

Vessel Type	Number of Port Calls[2,3]	Percentage of Total Calls[3]
Container	4570	46
Tank	2140	22
Bulk Carrier	1010	10
Automotive Carrier	830	8
General/Reefer	760	8
Unmanned Barge	520	5
Other	90	<1
Total	9,920	

1. Source: California State Lands Commission, 2005.
2. Does not include cruise ship vessels.
3. Numbers are rounded.

2. Oceangoing Ship Port Calls to California

The California State Lands Commission (CSLC) maintains a database of all ships entering California ports. For 2005, the database showed that approximately

1,900 different oceangoing ships (excluding cruise ships) of 300 gross registered tons or more entered California ports, for a total of approximately 9,900 port calls (CSLC, 2005). Table II-1 shows a breakdown of the locations of the California port calls.

Table II-2.
Oceangoing Ship Port Calls to California Ports in 2005[1,2]

Port Name	Number of Port Calls
Carquinez	680
El Segundo	230
Hueneme	410
Humboldt	20
Los Angeles & Long Beach[3]	5080
Oakland	1940
Redwood	50
Richmond	650
Sacramento	60
San Diego	390
San Francisco	180
Stockton	170
Other	60
Total	9920

1. Source: CSLC, 2005.
2. Numbers are rounded.
3. Port calls to Los Angeles and Long Beach are reported as a total and are not separated out.

B. Oceangoing Ship Onboard Incineration

Oceangoing ship onboard incineration is the combustion or burning of any materials or wastes for the purpose of volume reduction, destruction, sanitation, or sterilization. In general, oceangoing ship incinerators burn a variety of wastes. Although discussed further in Chapter IV, the most common waste streams incinerated aboard oceangoing ships, which call on California ports, include paper products and rags.

1. Toxic Air Contaminants Associated with Waste Incineration

There is a wide variety of toxic air contaminants (TACs) commonly associated with waste incineration. On a national level, municipal and medical waste incineration are associated with emissions of TACs. These types of sources are commonly identified in emission inventories as the largest group of emitters of polychlorinated dibenzo-*p*-dioxins (PCDDs or dioxins) and polychlorinated dibenzofurans (PCDFs or furans), a group of highly toxic compounds. However, in California, the number of medical waste incinerators has dropped sharply since the 1990's. Additionally, there are only three land-based municipal waste incinerator facilities currently operating in California, all of which are equipped with air pollution control devices.

Emissions of TACs can vary depending on the characteristics of the incinerator, the waste stream, and control equipment. However, the following TACs are generally associated with waste incineration.

- Heavy metals: arsenic, beryllium, cadmium, chromium, lead, mercury, and nickel;
- Hydrochloric acid; and
- Organic compounds (including dioxins and furans) and polycyclic aromatic hydrocarbons.

Additional information on these compounds can be found in Appendix F. Note that criteria pollutants, such as oxides of nitrogen (NOx), oxides of sulfur (SOx), and particulate matter (PM) can also be emitted from waste incineration.

2. Oceangoing Ship Waste Stream

Waste management onboard oceangoing ships is generally handled by a variety of processes depending on the waste stream. Wastes are incinerated onboard, or disposed of at port facilities or at sea. ARB staff conducted a survey to get a better understanding of oceangoing ship incinerator practices (detailed results of the survey can be found in Chapter IV). Table II-3 shows the types of waste that can be generated onboard an oceangoing ship based on the survey results.

Table II-3. Types of Waste Generated Onboard an Oceangoing Ship

Types of Waste	
Food wastes	Hazardous waste
Glassware, metal, bottles, and crockery	Batteries
Miscellaneous garbage	Printer cartridges
Rags	Medical waste
Graywater	Miscellaneous spray cans
Sewage or blackwater	Paint and solvents
Bilge water	Florescent light bulbs
Cardboard and paper products	Oil sludge and slops
Floating dunnage, lining, or packing material	Oily Waste
Plastics	Oil filters
Incinerator residue (ash)	Used oil
	Scrap metals

C. International and Federal Regulations for Onboard Incinerators

1. MARPOL 73/78 and Implementing Regulations

The International Maritime Organization (IMO) is a specialized agency of the United Nations which is responsible for measures to improve the safety and security of international shipping and to prevent marine pollution from ships. The IMO, along with other maritime nations, has developed standards which are set forth in the International

Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), which has been updated by amendments over the years. MARPOL 73/78 includes six technical annexes, which include regulations aimed at preventing and minimizing pollution from ships.

Compliance with MARPOL is mandatory, with the exception of certain government vessels. Specifically, Article 3 of MARPOL 73 states that "the present Convention shall not apply to any warship, naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service. However, each Party shall ensure adoption of appropriate measures not impairing the operations or operational capabilities of such ships owned or operated by it, that such ships act in a manner consistent, so far as is reasonable and practicable with the present Convention." Some government agencies maintain records with respect to onboard incineration. However, military agencies do not maintain records for onboard incineration.

MARPOL 73/78 contains two regulations for onboard oceangoing ship incinerators. Regulation 9 of Annex V of MARPOL 73/78 primarily deals with garbage recordkeeping requirements for onboard incineration. Annex VI prohibits the incineration of certain wastes and imposes additional operating requirements for incinerators.

a. Annex V

Annex V became effective December 31, 1988. In 1995, amendments were introduced that included the requirements for garbage management plans and garbage recordkeeping. These amendments became effective July 1, 1997. Specifically, ships of 400 gross registered tons or more must keep a record of each discharge operation or completed incineration. This includes discharges at sea, to reception facilities, or to other ships. The following information is required to be recorded when garbage is incinerated:

- Date and time of start and stop of incineration;
- Position of the ship (in latitude and longitude);
- Estimated amount incinerated in cubic meters; and
- Signature of the officer in charge of the operation.

For the purpose of recordkeeping requirements under Annex V, oceangoing ships are required to group garbage into the following categories:

- Plastics;
- Floating dunnage, lining, or packing material;
- Ground-down paper products, rags, glass, metal, bottles, crockery, etc.;
- Paper products, rags, glass, metal bottles, crockery, etc.; and
- Food waste.

Entries are required in the garbage record book when any of the following occur:

- When garbage is discharged into the sea;
- When garbage is discharged to reception facilities ashore or to other ships;
- When garbage is incinerated; and
- Accidental or other exceptional discharges of garbage.

The garbage record book is required to be kept onboard the ship for two years. The garbage record book requirements are contained in an Appendix to Annex V (see Appendix B of this report).

Ships less than 400 gross tons and certified to carry less than 15 people are not required to maintain records under MARRPOL 73/78. However, as specified in HSC 39631-39632, the requirements apply to oceangoing vessels 300 gross registered tons or more, regardless of the number of crew or passengers. The CSLC provided ARB staff a list of vessels which showed that three vessels fell between 300 and 400 gross registered tons. None of these three vessels made port calls to California in 2005, but may have made port calls in previous years. ARB staff could not verify whether or not any of these three ships conduct onboard incineration. Under the proposed amendments, oceangoing ships between 300 and 400 gross tons, as well as those at or above 400 gross tons, calling on California port or places would be subject to the proposed amendments.

b. Annex VI

Annex VI was adopted on September 26, 1997, and became effective May 19, 2005. Regulation 16 of Annex VI (Regulation 16) pertains to operating requirements and the prohibition of certain wastes for incineration. Regulation 16 requires incinerators installed after January 1, 2000, to meet certain requirements as specified in Appendix IV of Regulation 16 (Appendix IV). Onboard incinerators are required to possess an IMO Type Approval Certificate. To obtain the certificate, the incinerator must be designed and built such that it meets the standard specified in Regulation 16, section 2. Section 2 specifies that incinerators operate within certain limits. Some of the limits include operating at 6 to 12 percent oxygen in the combustion chamber and operating at 850 to 1200 degrees Celsius as the outlet combustion flue gas temperature range.

Under Annex VI the following types of waste are prohibited:

- Annex I, II, and III cargo residues and related contaminated packing materials;
- Polychlorinated biphenyls;
- Garbage, as defined in Annex V, containing more than traces of heavy metals; and
- Refined petroleum products containing halogen compounds.

Other prohibitory requirements for waste include polyvinyl chlorides except in incinerators for which IMO Type Approval Certificates have been issued. If sewage sludge and sludge oil is incinerated in the main or auxiliary power plant or boilers, it may not take place while the vessel is at ports, harbors, or estuaries.

Other requirements under Regulation 16 include regulations for monitoring flue gas outlet temperatures and operator and manual requirements. A copy of Regulation 16 and Appendix IV is provided in Appendix C.

c. Article 3 of MARPOL 73

Article 3 of MARPOL 73 states that "the present Convention shall not apply to any warship, naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service. However, each Party shall ensure adoption of appropriate measures not impairing the operations or operational capabilities of such ships owned or operated by it, that such ships act in a manner consistent, so far as is reasonable and practicable with the present Convention."

d. Act to Prevent Pollution from Ships

MARPOL 73/78 is implemented in the United States (U.S.) by the Act to Prevent Pollution from Ships (33 U.S.C. section 1901 *et seq.*). The U.S. Coast Guard is responsible for prescribing and enforcing regulations pursuant to MARPOL 73/78 in U.S. waters.

e. U.S. Coast Guard Regulations

The U.S. Coast Guard regulations implementing MARPOL 73/78 and the Act to Prevent Pollution from Ships are found at title 33, Code of Federal Regulations (CFR), section 151. In particular, subsection 151.55 requires the master or person in charge of the ship to maintain written records of the date and time of incineration (if incineration was conducted at a port), the name of the port, the latitude and longitude of the location where incineration was conducted and the estimated distance of that location from shore, and the amount of garbage incinerated. The records must be prepared at the time of incineration, certified by the master or person in charge of the ship, maintained on the ship for two years, and made available for inspection by the U.S. Coast Guard. Most oceangoing ships are required to follow these regulations; however, under title 33, CFR, section 151.51(b), warships, naval auxiliary, or other ships owned or operated by the United States when engaged in noncommercial services; and other ships specifically excluded by MARPOL 73/78 are not required to maintain records of incineration practices.

2. Animal and Plant Health Inspection Service Regulations

The U.S. Department of Agriculture, Animal, and Plant Health Inspection Service (APHIS), is responsible for regulations and policies governing the handling and disposal of regulated garbage to prevent the introduction of foreign animal and plant diseases and pests. These regulations are contained in the Code of Federal Regulations (CFR), title 7, section 330.400 and title 9, section 94.5.

Regulated garbage, as defined in the CFR, is derived in whole or in part from fruits, vegetables, meats, or other plants or animal material, and other refuse associated with the material onboard including food scraps, table refuse, galley refuse, food wrappers or packing materials and other waste material from stores, food preparation areas, passenger or crews quarters, dining rooms and other areas (ARB, 2005b). Most of the regulated garbage onboard oceangoing ships is subject to APHIS regulations.

Regulated garbage within the territorial waters or the territory of the U.S. is required to be destroyed by incineration to an ash or sterilization by cooking to an internal temperature of 212 degrees Fahrenheit for 30 minutes. Regulated garbage may also be ground and disposed of in an APHIS approved sewer system. Garbage on vessels that have not been outside the U.S. for the previous two years or have gone through an APHIS sanctioned "purging" process is not regulated.

III. PUBLIC OUTREACH AND REPORT PREPARATION

An open public process that involves all parties affected by the proposed amended Cruise Ship ATCM is an important component of ARB's actions. As part of ARB's outreach program, staff made personal contacts with industry representatives, as well as other parties, through meetings, telephone calls, and electronic mail. Staff developed a workgroup consisting of industry and environmental group representatives. Staff held two workgroup meetings and conducted one public workshop.

A. Public Involvement

As described below, affected industries, other government agencies, and organizations interested in minimizing public health impacts from oceangoing ship onboard incineration have been involved in the development of the proposed amended Cruise Ship ATCM. All members of the public were invited to join the workgroup. ARB staff also conducted a public workshop. Additionally, to further increase the general public's participation in this assessment, staff made information available via ARB's web site (*www.arb.ca.gov/toxics/shipincin/shipincin.htm*).

1. Industry Involvement

Industry representatives have participated in the rule development process providing technical information on many aspects of oceangoing ship onboard incineration. They have provided comments and suggestions on the recordkeeping and reporting requirements, definitions, and other issues related to the proposed amendments to the ATCM. Staff also received input from the United States Coast Guard and United States Navy (including Military Sealift Command), representing the military branches. The workgroup meetings have provided a forum to discuss and resolve many of the issues associated with the proposed amended Cruise Ship ATCM.

2. Government Agency Involvement

Other local, state, and federal agencies have provided input on certain aspects of the proposed amended Cruise Ship ATCM. Participating federal agencies include: United States military representatives, and the United States Department of Commerce's National Oceanic and Atmospheric Administration. Staff also had discussions with State agencies such as the California State Lands Commission, and the Department of Fish and Game. Additional discussions were held with the United States Department of Food and Agriculture regarding existing regulations for garbage generated onboard an oceangoing ship.

Local air districts have also been apprised of the regulatory process through the California Air Pollution Control Officers Association's Toxics and Risk Managers Committee. Some of the air district staff have provided additional information to ARB staff related to oceangoing ships and port activities.

B. Data Collection Tool Used to Assist in Report Preparation

In 2006, ARB staff developed a survey to gather information for onboard incineration garbage practices. The survey requested information on the amount and types of waste incinerated, the operating schedule of the incinerator, the air pollution control equipment, and other information related to onboard garbage incineration. See Chapter IV for a detailed discussion on the survey.

C. Issues

The military expressed concerns with onboard inspections. Military agencies which conduct onboard incineration and call on California ports include the United States Navy (including Military Sealift Command) and the United States Coast Guard (USCG). Due to heightened national security, clearance issues could arise for ARB inspectors to board military vessels. Each military branch has established policies to preserve national security while not denying legitimate entry for inspections. Prior to onboard inspections, ARB inspectors would follow these policies and procedures for each applicable military branch. ARB staff recognizes that non-military vessels may also have security procedures in place to address onboard inspections. To the extent that these security procedures are necessary to preserve national security while not denying legitimate entry for inspection, ARB inspectors would also follow these procedures.

D. Public Outreach after Office of Administrative Law Adoption of the Proposed Amended ATCM

If the Board adopts, and the Office of Administrative Law approves, the proposed amended ATCM, oceangoing ships and cruise ships will be notified of the new regulation through ARB's website and list serve. In addition, staff will work with other agencies, such as NOAA and the IMO, to determine other means of notifying oceangoing ships and cruise ships of the new regulation. NOAA's Office of Coast Survey has indicated that the final regulation could be published in the Coast Pilot. The Coast Pilot is a document used by mariners that includes applicable federal and state regulations for a given location.

In addition to the three nautical mile incineration prohibition, oceangoing ships between 300 and 400 gross registered tons will also need to be notified of the recordkeeping requirements. This is because these oceangoing ships are not required to maintain a garbage record log book as specified in Annex V of MARPOL 73/78. Recordkeeping will be a new requirement for these oceangoing ships, whereas ships of 400 gross registered tons or more are already keeping the required records under Annex V of MARPOL 73/78. ARB staff will notify subscribers of the list serve, and will also work with agencies, such as NOAA, IMO, and the CSLC, to determine other means of notifying oceangoing vessels between 300 and 400 gross registered tons of the new regulation.

IV. OCEANGOING SHIP ONBOARD INCINERATOR SURVEY

In May 2006, ARB staff sent out the Oceangoing Ship Onboard Incinerator Survey (Survey). The purpose of the Survey was to collect information on oceangoing ship onboard incineration and waste handling practices. Specifically, the Survey asked for information on the amount and type of waste burned, operating schedule, control equipment, and alternative waste treatment to onboard incineration. Appendix D contains a copy of the Survey.

With the exception of cruise ships, oceangoing ships of 300 gross tons or more calling on California ports or places were required to fill out the Survey. Cruise ships were not required to fill out the Survey because they completed a similar survey in 2005. Approximately 395 ship operators responded to the survey. Staff compared that number to the California State Lands Commission (CSLC) database that showed that in 2005 approximately 1,900 ships (not including cruise ships) made one or more calls to California ports. Our survey responses accounted for about 20 percent of the vessels calling on California ports.

A. Incinerators Onboard Oceangoing Ships

Unlike the cruise ship industry, not all oceangoing ships have incinerators onboard their vessels. Of the 395 vessels that responded to the Survey, 173 vessels (44 percent) indicated that they do not have onboard incinerators. One ship indicated that it had two onboard incinerators. Table IV-1 summarizes the number of incinerators onboard oceangoing vessels.

Table IV-1. Number of Oceangoing Ships with Onboard Incinerators

Number of Incinerators	Number and Percentage of Survey Responses
No Incinerators	173 (44 percent)
One Incinerator	221 (56 percent)
Two Incinerators	1 (< 0.01 percent)

B. Type of Waste Incinerated

The Survey was designed to obtain general information on the type of waste commonly incinerated onboard oceangoing ships. The Survey asked the oceangoing ship operators to specify which type of waste they incinerated similar to the categories in the Garbage Record Book required by Regulation 9 of Annex V of MARPOL 73/78. More information on waste categories specified under Annex V can be found in Chapter II. The Survey specified seven categories of garbage from which to choose.

Table IV-2 shows the type of waste and percentage of ships that incinerate the waste. The results show that the most commonly incinerated waste is paper products and rags.

Table IV-2. Type of Waste and Percentage of Survey Responses Incinerating this Waste

Type of Waste	Number of Ships Incinerating this Type of Waste	Percentage of Ships Incinerating this Type of Waste
Plastics (including light plastic)	33	15
Floating dunnage, lining, or packing material	36	16
Paper products	183	82
Rags	198	89
Glass, metal, bottles, crockery, etc.	4	2
Food waste	6	3
Other[1]	83	37

1. Most common other wastes include sludge oil, waste oil, oil filters, and cardboard.

C. Amount of Waste Incinerated

The Survey requested the total amount of waste burned in either cubic meters (m^3) per year or in tons per year (tpy). Under Annex V, oceangoing ships are only required to report the amount of waste incinerated in cubic meters per year; therefore, most oceangoing ships provided the amount of garbage in cubic meters per year. Without knowing the densities of the individual waste streams, it is difficult to convert from cubic meters to tons. Therefore, Table IV-3 shows the minimum, maximum, average, amount of waste incinerated per oceangoing ship in m^3 per year and in tpy. The total amount is the summation of all ships' incinerated waste reported from the Survey.

Table IV-3. Waste Incinerated per Year[1,2]

	Minimum	Maximum	Average	Total
Total waste burned per year per ship (m^3/year) (172 ships reporting)	0	2,300	70	12,100
Total waste burned per year per ship (tons/year) (30 ships reporting)	0.05	2,600	110	3,300

1. The total waste burned is the sum of the oceangoing ship's total waste (not just within three nautical miles of California coast).
2. Numbers are rounded.

The Survey results showed that prior to January 1, 2006, the effective date of SB 771, three of the 222 vessels (one percent) with incinerators incinerated within three

nautical miles of the California coast. This is consistent with discussions with several companies who indicated that their ships did not incinerate waste while at port or within three nautical miles of land. Some of the larger companies indicated they have policies which prohibit incineration further out then three nautical miles, such as 12 or 25 nautical miles off-shore. Table IV-4 summarizes the amount of waste incinerated in 2005 within three nautical miles of the California coast reported by three oceangoing ships.

Table IV-4. Waste Incinerated within Three Nautical Miles of the California Coast in 2005[1]

Oceangoing Ships	Waste Incinerated (m^3)
Ship One (Bulk Carrier)	0.04
Ship Two (Auto Carrier)	0.06
Ship Three(Auto Carrier)	0.45
Total	0.55

1. Amount reported was for incineration prior to January 1, 2006, the effective date of SB 771.

For the three ships listed in Table IV-4, the waste they incinerated within three miles of the California coast makes up less than 0.01 percent of each of their total waste incinerated.

D. Operating Schedule

The Survey asked oceangoing ship operators to include information about the incinerator operating schedule. Table IV-5 shows the minimum, maximum, and average for the hours per day of operation, and days per week of operation.

Table IV-5. Incinerator Operating Schedule

	Minimum	Maximum	Average
Hours per day of operation	0	24	6
Days per week of operation	0	7	2

E. Alternatives to Onboard incineration

In addition to onboard incineration, oceangoing vessels use other means to dispose of wastes generated onboard the ship. Almost all oceangoing ships indicated that a portion of their waste is disposed of at port. Waste most commonly disposed of at port include: plastics, batteries, incinerator ash, sludge and waste oil, and hazardous waste. Some indicated that whenever possible, items such as cans, cardboard, glass and metal are separated out for recycling at the port.

Most ships reported that food waste is disposed of at sea. Some ships reported that other types of garbage, such as packing materials, paper, rags, glass, metal and bottles are also disposed of at sea. With the exception of plastics, the disposal of items out to sea is allowed in most areas under MARPOL regulations. Note however, that a ship must be a certain distance from land (ranges from three to 25 miles) to discharge certain types of waste to sea.

F. Other Survey Information

1. Control Equipment

Based on the Survey responses, oceangoing ships do not have air pollution control devices on their incinerators.

2. Garbage Record Log

With the exception of most military vessels, all ships reported that they maintain a garbage record log as specified by Annex V of MARPOL 73/78.

3. Number of Crew

The average number of crew onboard oceangoing ships is 19.

G. Military Ships

Military ships of 300 gross registered tons or more calling on California ports or places are also subject to SB 771. Because of security concerns, the military requested that the information be categorized and summarized to include the number and class of vessels and incinerator manufacturer and model.

Overall, the Navy (including Military Sealift Command) and USCG have approximately 20 vessels, which have onboard incinerators. One of those ships has two incinerators onboard. The military has indicated that their ships do not incinerate within 3 nautical miles of the California coast and in most instances do not incinerate within 12 nautical miles of the California coast. Specifically, the Navy (including Military Sealift Command) has a policy which prohibits onboard incineration within 12 nautical miles of the California coast, and the USCG has a policy that prohibits incineration within 3 nautical miles of the California coast.

H. Survey Conclusions

By extrapolating from the Survey, staff estimates that approximately 1,060 (56 percent) of the 1,900 oceangoing ships have onboard incinerators. Of those 1,060 oceangoing ships, staff estimated that about 11 (one percent) of those oceangoing ships conducted onboard incineration within three miles of the California coast prior to January 1, 2006, the effective date of SB 771. Based on the Survey information from

the three ships that incinerated waste within three nautical miles of the California coast, the amount of waste incinerated within the three nautical mile zone was negligible, less than 0.01 percent of each of their total waste incinerated.

V. POTENTIAL HEALTH IMPACTS OF SUBSTANCES EMITTED FROM ONBOARD INCINERATION

A. Health Impacts Associated from Waste Incineration

As presented in Chapter II, toxic air contaminants that can be emitted from waste incineration include heavy metals such as arsenic, beryllium, cadmium, chromium, lead, mercury and nickel. Organic compounds such as dioxins, furans, and polycyclic aromatic hydrocarbons can also be emitted along with hydrochloric acid. Many of these substances have been identified by state, federal, and international agencies as known or probable human carcinogens. Noncancer effects can range from skin and lung irritation to disorders of the developmental and central nervous systems. For a summary of some of the cancer and noncancer health effects that can occur due to short or long-term exposure to these compounds, see Appendix F.

B. Potential Health Impacts Remaining after Implementation of the Proposed Amendments

The ARB staff conducted an evaluation of the potential health impacts from the proposed amended Cruise Ship ATCM. Because the standard (i.e., no incineration within three miles of the California coast) was already set forth in AB 471 and SB 771, staff focused its efforts on assessing the potential health risk remaining after implementation to ensure that it was adequately health protective. ARB staff conducted a qualitative assessment for oceangoing ships onboard incineration and compared it to the quantitative assessment conducted for cruise ships as previously evaluated in the Cruise Ship Staff Report (ARB, 2005a). Based on several factors, such as the significantly lower amounts of waste generated and incinerated onboard, smaller numbers of crew, limited operating times, prohibitory company policies, and military policies, ARB staff has determined that potential health impacts due to incineration onboard oceangoing vessels would be less than the potential health impacts from incineration onboard cruise ships.

In the Cruise Ship Staff Report, staff estimated potential cancer and noncancer health impacts from cruise ship onboard incineration. For that analysis, the incineration of waste was assumed to be taking place from three nautical miles to 30 nautical miles out to sea. Based on the risk assessment results, the estimated potential cancer risk ranged from 0.6 to 1.9 chances per million. For noncancer chronic health impacts, the hazard index for both the resident and the on-shore worker is less than 0.1. For acute health impacts the hazard index is less than 0.3. In general, a hazard index less than one is not a concern to public health. For more information on cruise ship risk assessment results, see Chapter V of the Cruise Ship Staff Report (ARB, 2005a). Based on this analysis, staff concluded that the three nautical mile limit for onboard incineration is sufficiently protective of public health.

In 2005, Approximately 1,900 oceangoing (non-cruise ship) ships entered California ports one or more times. Based on the Survey, approximately 56 percent of

the oceangoing ships reported having onboard incinerators. By assuming 56 percent of the 1,900 oceangoing ships have incinerators, then approximately 1,100 oceangoing ships have incinerators. The Survey also showed that each oceangoing ship incinerates about 70 m^3 of waste per year. Based on this, the total waste incinerated onboard oceangoing vessels would be approximately 77,000 m^3 per year. This is less than the total amount reported for cruise ships, which was estimated to be about 95,000 m^3 per year in 2004 (ARB, 2005c).

ARB staff also evaluated the Port of Los Angeles and Long Beach (LA/LB) where approximately 5,000 (non-cruise ship) port visits occurred in 2005. Staff evaluated this port because it has significantly more port visits then any other port in the State. Approximately 1,500 (non-cruise ship) oceangoing vessels accounted for the LA/LB port visits. If we assume that 56 percent of these ships have incinerators and each oceangoing ship incinerates 70 m^3 of waste, then approximately 840 oceangoing ships would incinerate about 59,000 m^3 of waste. As a comparison, 32 cruise ships visited the LA/LB ports in 2005. Based on ARB's 2004 cruise ship survey, on average each ship incinerates approximately 4,300 m^3 of waste per year. Therefore, about 138,000 m^3 of waste are incinerated by cruise ships. Based on staff estimates, oceangoing ships incinerate about one-half of the waste incinerated by cruise ships.

In addition to the amount of waste generated onboard the average number of people onboard the oceangoing vessels is significantly lower than onboard a cruise ship. On oceangoing ships, the average number of crew is 19, as compared to several thousands of crew and passengers aboard a cruise ship.

The amount of incinerator operation time is significantly lower for oceangoing ships than for cruise ships. The cruise ships reported operating their incinerator on average 5.5 days per week for 12 hours per day. The Survey showed the oceangoing vessels operate their incinerators on average two days per week for six hours per day.

Several of the large shipping companies indicated that they have formal and informal policies which prohibit or discourage incineration beyond three nautical miles from the coast. Some companies indicated that they do not incinerate or have policies which discourage incineration within 25 or 50 miles from the coast. Additionally, the military has policies which prohibit onboard incineration within 12 nautical miles of the California coast (United States Navy and Military Sealift Command) and within 3 nautical miles of the California coast (USCG).

VI. SUMMARY OF THE PROPOSED AMENDED CONTROL MEASURE

This chapter contains a summary of the proposed amended Cruise Ship Airborne Toxic Control Measure (ATCM). It also reviews the basis and rationale for selecting the provisions being proposed. A copy of the proposed amended Cruise Ship ATCM regulation is located in Appendix A.

The proposed amended Cruise Ship ATCM incorporates oceangoing ships into the ATCM, clarifies the definition of "cruise ship," amends the recordkeeping requirements for cruise ships, adds recordkeeping requirements for oceangoing ships, and establishes special recordkeeping requirements for military vessels. The proposed regulation is expected to reduce potential health impacts for residents and off-site (i.e., off-ship) workers living or working near ports or along the California coast.

A. Summary of the Proposed Amended Control Measure

1. Affected Sources

In addition to cruise ships already subject to the ATCM, the proposed amended Cruise Ship ATCM would also apply to oceangoing ships calling on California ports or places. Oceangoing ships are defined as a private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places. An oceangoing ship does not include a cruise ship. Based on 2005 vessel data from the California State Lands Commission database, ARB staff estimated that approximately 1,900 different oceangoing ships (excluding cruise ships) entered California ports, for a total of approximately 9,850 port calls (CSLC, 2005).

2. Requirements for Cruise Ship and Oceangoing Ship Owners or Operators

In addition to the prohibition for cruise ships, oceangoing ship owners or operators are prohibited from conducting onboard incineration within three nautical miles of the California coast. However, onboard incineration within three nautical miles of the California coast may be permitted when operated under the direction of the United States Coast Guard (USCG). Although it is not common practice, the USCG may require an operational test of the incinerator during in-port inspections. For example, this may be required if USCG personnel expect illegal oil discharge has occurred.

"Within three miles of the California coast" is defined as between the coast and the Three Nautical Mile Line as shown on the following National Oceanic and Atmospheric Administration (NOAA) Nautical Charts, as authored by the NOAA Office of Coast Survey.

- Chart 18600, Trinidad Head to Cape Blanco (January 2002);
- Chart 18620, Point Arena to Trinidad Head (June 2002);
- Chart 18640, San Francisco to Point Arena (August 2005);
- Chart 18680, Point Sur to San Francisco (June 2005);
- Chart 18700, Point Conception to Point Sur (July 2003);
- Chart 18720, Point Dume to Purisima Point (January 2005); and
- Chart 18740, San Diego to Santa Rosa Island (April 2005).

a. Use of the NOAA Nautical Charts for Determining the Baseline (Coast)

ARB staff recognizes that other California agencies use different baselines for various purposes, including for determining the coastal zone, state waters, coastal waters, and California's territorial boundaries. In most cases, these baselines broaden the agencies' jurisdictional authority. However, ARB staff interprets "within three miles of the California coast, to the extent allowed by federal law," as provided in AB 471, SB 771, and Health and Safety Code (HSC) section 39632, to mean within the Three Nautical Mile Line recognized by federal law which is depicted on NOAA nautical charts.

b. Updates to the NOAA Charts

NOAA routinely updates its nautical charts to update hazards to navigation and other information considered essential for safe navigation, and any changes made to the baseline by the United States Baseline Committee. It is anticipated that NOAA will be updating the charts for the California coast in the near future. As the NOAA charts are recognized by federal law and mandated by State law for purposes of this proposed amended Cruise Ship ATCM, the Three Nautical Mile Line will be as depicted on the current NOAA charts, as updated by NOAA from time to time. This is because HSC section 39632 prohibits incineration "...within three miles of the California coast..." That location, i.e., three miles of the California coast, is a geographical fact independent of whether NOAA has a nautical chart for the area or whether the chart has been updated. In other words the NOAA nautical chart is merely a physical depiction at any given time. The NOAA nautical charts are used for convenience and consistency.

However, when the NOAA nautical charts are updated by NOAA, the Executive Officer may revise the definition of "within three miles of the California coast" to incorporate the updated charts. This particular change does not materially alter any requirement, right, responsibility, condition, prescription or other regulatory element of the ATCM because HSC 39632 prohibits incineration within three miles of the California coast and the NOAA nautical charts are used as tools to graphically depict the location of the three nautical mile limit. Cruise ship and oceangoing ship owners and operators will be notified at least 30 days before the updates take effect. Notifications to oceangoing ship owners or operators will be sent in the following ways: a notice will be published in the California Notice Register; an electronic notice which will be sent to all subscribers of the oceangoing ship incineration list serve and cruise ship incineration list

serve; and a notice will also be posted to the oceangoing ship incineration website at www.arb.ca.gov/toxics/shipincin/shipincin.htm.

c. Availability of NOAA Nautical Charts

For information on obtaining copies of the NOAA nautical charts, please visit NOAA's website at http://chartmaker.ncd.noaa.gov.

3. Recordkeeping and Reporting Requirements

With the exception of military vessels, cruise ship and oceangoing ship owners or operators are required to record the following information while operating in Regulated California Waters (RCW).

- The date and time of start and stop of incineration (in local time);
- The position of the ship in latitude and longitude for each start and stop time of incineration;
- The estimated amount incinerated in cubic meters (m^3);
- The name or signature of officer in charge of the operation; and
- When operation of the incinerator is required by the USCG, the name, unit, and phone number of USCG personnel who directed that the incinerator be operated.

This information is required when operating within RCW, which is approximately 24 nautical miles from the California coast.

Records are to be maintained in English and kept onboard the cruise ship or oceangoing ship for two years. During an onboard inspection, these records are to be made available to ARB personnel or their delegates. In addition, upon written request by the Executive Officer of ARB, the owner or operator of the cruise ship or oceangoing ship shall provide copies of the records within 30 calendar days of the request. Records may be kept electronically, if desired.

Except for information required when the incinerator is operated at the direction of the USCG, the recordkeeping requirements in the proposed amended Cruise Ship ATCM are also required under Regulation 9 of Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (Annex V) (see Appendix B). Oceangoing ships of 400 gross registered tons or more are required to maintain this information in a garbage record log book. Under the proposed amendments, ships between 300 and 400 gross tons will also need to maintain the same records that are required by MARPOL 73/78. Although ARB staff did not identify any oceangoing vessels between 300 and 400 gross registered tons, which call on California ports or places and conduct onboard incineration, they would be subject to the recordkeeping requirements in the proposed amended Cruise Ship ATCM.

4. Recordkeeping Requirements for Military Vessels

Military agencies are exempt from recordkeeping requirements under USCG regulations. As specified in MARPOL 73, Article 3, in certain situations, MARPOL 73 requirements do not apply to military vessels. However, owners or operators of military vessels are required to "...ensure by the adoption of appropriate measures not impairing the operations or operational capabilities of such ships owned or operated by it, that such ships act in a manner consistent, so far as is reasonable and practicable, with the present Convention." The military currently has formal policies limiting onboard incineration; however, there are no incineration recordkeeping requirements in the policies. Under the proposed amended Cruise Ship ATCM records for military vessels are required to be kept when the incinerator is operating within three nautical miles of the California coast.

5. Definitions

Several definitions have been included in subsection (c) of the proposed amended Cruise Ship ATCM to ensure clarity. These definitions were taken from HSC 39631, Bureau of Customs and Border Protection regulations, marine vessel industry documents, and prior ARB rulemakings.

6. Other Changes Affecting Cruise Ships

The proposed amended Cruise Ship ATCM adds a requirement for cruise ships to record additional information when the incinerator is operated under the direction of the USCG. Although not a common occurrence, the USCG can require the owner or operator of the vessel to operate the incinerator during an inspection. This can occur, for example, if the USCG suspects that illegal oil discharge has occurred. Costs for this additional recordkeeping requirement are negligible.

In the Cruise Ship ATCM, cruise ships are required to keep records for each segment of a voyage if, during any portion of that segment, the cruise ship travels within three miles of the California coast. The segment of the voyage is defined as from the last port of call to the next port of call. In the proposed amended ATCM, records are required when traveling in Regulated California Waters (RCW). In Northern and Central California the RCW boundary follows the 24 nautical mile contiguous zone, an internationally recognized boundary. In Southern California the boundary consists of straight line segments approximately 24 nautical miles offshore of the coastline. Staff has limited the recordkeeping requirement to the RCW since we are primarily concerned with emissions occurring near California's coastline. Additionally, RCW has been introduced in several other marine regulations developed by the ARB and will provide for a consistent definition for the marine industry. Impacts to the cruise ship industry are negligible since these records are already kept under MARPOL Annex V.

The proposed amended Cruise Ship ATCM also clarifies the definition of "cruise ship" to mean those cruise ships calling on California ports or places. This proposed modification was made to avoid the inclusion of cruise ships traveling in innocent passage.

B. Basis and Rationale for the Control Measure

Effective January 1, 2006, SB 771 prohibited oceangoing ships from conducting onboard incineration within three (nautical) miles of the California coast. The purpose of the proposed amended Cruise Ship ATCM is to ensure that this legislation is implemented and adequately enforced. The proposed regulation amends the existing Cruise Ship ATCM.

On a national level, land-based garbage and municipal waste incineration have been associated with emissions of large amounts of toxic air contaminants (TACs). Incineration of waste is associated with emissions of various air pollutants, including polychlorinated dibenzodioxins (PCDDs or dioxins), polychlorinated dibenzofurans (PCDFs or furans), and toxic metals which can cause cancer and noncancer health impacts. ARB has previously identified and developed regulations for dioxins, furans, and certain metal compounds as TACs and these compounds are listed as hazardous air pollutants by the United States Environmental Protection Agency (U.S. EPA). PCDDs and PCDFs are the most toxic compounds which have been identified by the ARB. These toxic substances can be inhaled directly or can contaminate vegetation and be consumed by animals and humans. PCDDs and PCDFs then accumulate in the body. Many studies, including U.S. EPA's Dioxin Reassessment, have shown that PCDDs and PCDFs can cause cancer and other health problems including birth defects and liver damage.

Regulations are currently in place for existing land-based waste incinerators in California. Waste incinerators, such as medical and municipal waste incinerators, are subject to local air district air permitting requirements, district prohibitory rules, the Medical Waste Incinerator ATCM (Title 17, CCR section 93104), the Outdoor Residential Waste Burning ATCM (Title 17, CCR section 93113), and the Assembly Bill 2588 "Hot Spots" program (HSC 44300 *et seq.*). These programs limit the amount of land-based incinerator emissions that may be released into the environment. Additionally, there are federal requirements for municipal and medical waste incinerators.

Currently there are no incinerator emission limits or control requirements for oceangoing ship onboard incinerators, which call on California ports or places. In 2005, at the Port of Los Angeles, there were approximately 5,075 oceangoing ship port calls. In the absence of SB 771 and the proposed amended Cruise Ship ATCM, oceangoing ships could incinerate waste while entering the port, at the port, and leaving the port. This amounts to substantial periods of time that oceangoing ships could be incinerating near the coast. In addition, there are many berths at the port which can be used simultaneously and where onboard incineration could occur if SB 771 and the proposed

amended Cruise Ship ATCM were not implemented and enforced. Thus, in the absence of SB 771, adverse public health impacts could occur to residents and off-site workers who live or work near the coast. In recognition of the potential for adverse health impacts from incineration near shore, most oceangoing ship owners/operators discontinued incineration near shore prior to January 1, 2006. In fact, staff identified only a small number of ships which incinerated within three nautical miles of the California coast prior to January 1, 2006, the effective date of SB 771.

With the exception of military and government agencies, the recordkeeping requirements are similar to recordkeeping requirements under Annex V of MARPOL. The only additional requirement under the proposed amended Cruise Ship ATCM is the name, unit, and phone number of USCG personnel when operation of the incinerator is required by USCG personnel and is within three nautical miles of the California coast. This requirement is necessary so that ARB inspectors can verify that incineration was under the direction of the USCG. Overall, this is a cost-effective approach, which, along with onboard inspections, will allow ARB inspectors to determine compliance with the proposed amended Cruise Ship ATCM.

C. Alternatives Considered

1. No Action

One alternative is to forego the development of the proposed amended Cruise Ship ATCM. This alternative is not recommended. Oceangoing ships are equipped with incinerators that burn a variety of wastes such as plastics, packing materials, paper, cardboard, rags, food, oil filters, and oily sludge. The emissions from onboard incineration can include TACs such as dioxins, furans, hydrogen chloride, hydrocarbons, manganese, and toxic metals such as lead, cadmium, chromium, arsenic, beryllium, nickel and mercury. Criteria pollutants such as nitrogen oxide, sulfur oxide, carbon monoxide, carbon dioxide, and particulate matter can also be emitted.

If ARB did not develop this control measure, then incineration recordkeeping and reporting would not be required by the State. Without these requirements it would be difficult to determine compliance with SB 771. Therefore, the proposed amended Cruise Ship ATCM is critical to determine compliance and to meet the legislative mandate.

2. Eliminating Certain Recordkeeping Requirements

ARB staff considered deleting the requirement for recording the amount of waste incinerated. However, staff has determined that this is not a feasible alternative. If an oceangoing ship owner or operator conducted onboard incineration within three nautical miles of the California coast, then knowing the amount incinerated is necessary to assess any penalties involved. In addition, reporting the amount of waste incinerated is already required under Annex V, for most of the vessels, so it is not expected to be an additional burden for the industry.

3. Extending the Prohibition Zone

ARB staff considered extending, beyond three nautical miles, the zone in which onboard incineration is prohibited. However, based on Survey information and the qualitative assessment of potential health impacts presented in Chapter V, ARB staff determined that the three nautical mile limit for onboard incineration is sufficiently health protective.

4. Other Prescriptive Standards

Staff did not consider other prescriptive standards because the standard was set forth in SB 771 (i.e., no onboard incineration is permitted within three nautical miles of the California coast).

D. Concerns Regarding the Proposed Amended Cruise Ship ATCM

1. Military Issues

The military expressed concerns with onboard inspections. Military agencies, which conduct onboard incineration and call on California ports include the United States Navy (including Military Sealift Command) and the USCG. Due to heightened national security, clearance issues could arise for ARB inspectors to board military vessels. Each military branch has established policies to preserve national security while not denying legitimate entry for onboard environmental inspections. Prior to onboard inspections, ARB inspectors would follow these policies and procedures for each applicable military branch.

E. Differences between the Proposed Amended ATCM and State and Federal Regulations

1. U.S. Coast Guard Regulations

MARPOL 73/78 is implemented in the United States by the Act to Prevent Pollution from Ships (33 U.S.C. section 1901 *et seq.*). The USCG is responsible for prescribing and enforcing regulations pursuant to MARPOL 73/78 in U.S. waters. The USCG regulations implementing MARPOL 73/78 and the Act to Prevent Pollution from Ships are found at title 33, Code of Federal Regulations (CFR), section 151. In particular, subsection 151.55 requires the master or person in charge of the ship to maintain written records of the date and time of incineration (if incineration was conducted at a port), the name of the port, the latitude and longitude of the location where incineration was conducted and the estimated distance of that location from shore, and the amount of garbage incinerated. The records must be prepared at the time of incineration, certified by the master or the person in charge of the ship, maintained on the ship for two years, and made available for inspection by the USCG.

Most oceangoing ships are required to follow the USCG regulations; however, under section 151.51, warships, naval auxiliary, or other ships owned or operated by the United States when engaged in noncommercial services; and other ships specifically excluded by MARPOL 73/78 are not required to maintain records of incineration practices. While the USCG regulations exempt the military from maintaining records of incineration, the proposed amended ATCM requires recordkeeping within three nautical miles of the California coast. However, recordkeeping in this zone is necessary to verify compliance with the proposed amended ATCM. Military policy prohibits incineration within three nautical miles (USCG) and Navy (12 nautical miles), so records would only be required if they are out of compliance with the proposed amended ATCM (unless operation of the incinerator is required by the USCG). Therefore, recordkeeping costs should be negligible. Furthermore, this recordkeeping is necessary, because, if incineration is occurring within three nautical miles of the California coast, adverse health impacts could occur to nearby communities.

The proposed amended Cruise Ship ATCM expressly requires owners or operators of oceangoing ships and cruise ships subject to the requirements of the regulation, to maintain records when the incinerator is operating in RCW. While the USCG regulations only require the records to be made available for inspection by the USCG, the proposed amended Cruise Ship ATCM requires that the records be made available to ARB personnel, or their delegates. Access to these records by ARB personnel, or their delegates is necessary to adequately enforce the proposed amended Cruise Ship ATCM, to reduce emissions of toxic air contaminants (TACs), such as dioxins, furans, and toxic metals along the coast, and to reduce the potential for adverse health impacts to residents and offsite workers who live or work near ports and along the coast.

The records required by the proposed amended Cruise Ship ATCM are substantially similar to the records required by the USCG regulations, with two exceptions. USCG regulations require the signature of the officer in charge of the operation. However, the proposed amended Cruise Ship ATCM allows either the name or signature of the officer in charge of the operation. This difference, allowing the name or the signature, was incorporated into the proposed amended Cruise Ship ATCM at the request of the industry. During workgroup discussions, the industry commented that allowing the name rather than the signature in the records facilitated electronic recordkeeping. The other difference is the recordkeeping requirement to include USCG personnel information when operation is required under the direction of the USCG. The name, phone number, and unit of the USCG personnel are required. This is necessary so that ARB inspectors can verify that incinerator operation within three nautical miles was required by the USCG. Incinerator operation required by the USCG is not common, but can be necessary, for example, if illegal waste dumping is suspected. The cost of recording this additional information will be negligible, but will assist in enforcing the regulation.

For the foregoing reasons, in accordance with Government Code section 11346.2(b)(5)(B), the Executive Officer has determined that the cost of this differing

state regulation is justified by the benefit to human health, public safety, public welfare, or the environment.

2. Animal and Plant Health Inspection Service Regulations

The U.S. Department of Agriculture, Animal, and Plant Health Inspection Service (APHIS) regulations require regulated garbage within the territorial waters or the territory of the U.S. to be destroyed by incineration to an ash or sterilization by cooking to an internal temperature of 212 degrees Fahrenheit for 30 minutes in order to prevent the introduction of foreign animal and plant disease and pests. Regulated garbage may also be ground and disposed of in an APHIS approved sewer system. Garbage on vessels that have not been outside the U.S. for the previous two years or have gone through an APHIS sanctioned "purging" process is not regulated. "Regulated garbage" is defined as garbage derived in whole or in part from fruits, vegetables, meats, or other plants or animal material, and other refuse associated with the material onboard including food scraps, table refuse, galley refuse, food wrappers or packing materials and other waste material from stores, food preparation areas, passenger or crews quarters, dining rooms and other areas. Most of the regulated garbage onboard oceangoing ships and cruise ships are subject to APHIS regulations.

While the APHIS regulations allow incineration of regulated garbage within the territorial waters (12 nautical miles of the coast), the proposed amended Cruise Ship ATCM expressly prohibits incineration within three nautical miles of the California coast. APHIS regulations do, however, provide alternative means of managing regulated garbage while the oceangoing ship or cruise ship is within three nautical miles of the California coast (i.e., sterilization or disposal in an APHIS approved sewer system). Oceangoing ship and cruise ship operators can also keep international regulated garbage in leakproof, covered containers during the time they are traveling within three nautical miles or while at port.

By prohibiting incineration within three nautical miles of the California coast, the potential for adverse health impacts will be reduced for residents and offsite workers who live or work near ports and along the coast. The proposed amended Cruise Ship ATCM is expected to reduce emissions from TACs, such as polychlorinated dibenzo-p-dioxins (PCDDs or dioxins), polychlorinated dibenzofurans (PCDFs or furans), and toxic metals. Moreover, the benefit to human health, public safety, public welfare, and the environment as a result of the proposed amended Cruise Ship ATCM is anticipated to increase dramatically as the oceangoing ship and cruise ship industries in California are fast growing industries.

AB 471 and SB 771 were passed by the California Legislature and signed by the Governor in 2004 and 2005, respectively. Effective January 2005 and 2006 (respectively), cruise ships and oceangoing ships were prohibited from conducting onboard incineration while operating within three miles of the California coast. The proposed amended Cruise Ship ATCM implements AB 471 and SB 771 and ensures that this law is adequately enforced.

Finally, in accordance with Government Code section 11346.2(b)(5)(B), the Executive Officer has determined that the cost of differing state regulations is justified by the benefit to human health, public safety, public welfare, or the environment.

VII. ECONOMIC IMPACTS OF THE PROPOSED AMENDMENTS TO THE CRUISE SHIP ATCM

This chapter discusses the impacts of the proposed amendments to the oceangoing ship and cruise ship industries and costs to local, state, and federal agencies. Information on the economic impacts to the cruise ship industry can be found in the Cruise Ship Staff Report. Overall, the proposed amendments to the Cruise Ship ATCM are not expected to result in any significant economic impacts. The costs to the oceangoing ship and cruise ship industries are negligible.

The proposed amended Cruise Ship ATCM is not expected to have an impact on the creation or elimination of jobs and businesses, or the competitiveness of oceangoing ships traveling to California ports.

Negligible costs were identified for public agencies.

A. Legal Requirements

Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall include a consideration of the impact of the proposed regulation on California jobs, business expansion, elimination or creation, and the ability of California business to compete with businesses in other states.

Also, State agencies are required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. The estimate shall include any non-discretionary cost or savings to local agencies and the cost or savings in federal funding to the State.

Health and Safety Code section 57005 requires ARB to perform an economic impact analysis of submitted alternatives to a proposed regulation before adopting any major regulation. A major regulation is defined as a regulation that will have a potential cost to California business enterprises in an amount exceeding ten million dollars in any single year. The proposed amended Cruise Ship ATCM is not a major regulation.

B. Affected Businesses

Approximately 1,400 oceangoing ship companies traveled into California ports during 2005. None of these companies are small businesses. These 1,400 companies accounted for about 1,900 different vessels entering California ports. Most of these vessels are foreign-flagged. ARB staff conducted the Oceangoing Ship Onboard Incinerator Survey (Survey) to get information on oceangoing ship waste incineration practices. Responses from that Survey showed that prior to January 1, 2006, when SB 771 took effect, only three out of 395 (<1 percent) of oceangoing ships, which responded to the survey incinerated within three nautical miles of the California coast.

For these oceangoing ships, a change in operating schedule of the incinerator was necessary to ensure that incineration stopped before the oceangoing ship arrived within three nautical miles of the California coast. Some of the larger companies indicated they have policies, which prohibit or discourage incineration within 25 or 50 miles from the California coast.

With the exception of the military and government owned or operated vessels, the recordkeeping requirements for the proposed amended Cruise Ship ATCM are similar to the current recordkeeping requirements under Regulation 9 of Annex V of the International Convention of the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78 or Annex V). Annex V requires each oceangoing ship to maintain garbage record logs indicating the date and time of start and stop of incineration, the position of the ship, the estimated amount of garbage incinerated, and the signature of officer in charge. Because oceangoing ship operators are already required to keep these records, recordkeeping costs from this regulation would be negligible. The proposed amended Cruise Ship ATCM adds a requirement for cruise ships and oceangoing ships to record additional information when the incinerator is operated under the direction of the USCG. Although not a common occurrence, the USCG can require the owner or operator of the vessel to operate the incinerator during an inspection. This can occur, for example, if the USCG suspects that illegal oil discharge has occurred. Costs for this additional recordkeeping requirement are negligible.

Ships between 300 and 400 gross tons are not required to maintain records under MARPOL 73/78. However, as specified in HSC 39631-39632, the proposed amended Cruise Ship ATCM will apply to oceangoing vessels 300 gross registered tons or more. ARB staff did not identify any oceangoing vessels between 300 and 400 gross registered tons, which conduct onboard incineration. However, under the proposed amendments, ships between 300 and 400 gross tons conducting onboard incineration could incur negligible costs for recordkeeping during the time the oceangoing ship is traveling in Regulated California Waters.

Reviewing the garbage record logs will assist ARB in ensuring compliance with SB 771. Under the proposed amended ATCM, inspectors are permitted to inspect and copy the garbage record logs to ensure that onboard incineration has not occurred within three nautical miles of the California coast. Copying costs for these records would be negligible. In addition, there could be minimal costs for the oceangoing ship officer's staff time to be present during onboard inspections. It is not expected that an onboard inspection would take longer than one hour.

Although many oceangoing ships already carry the specified National Oceanic and Atmospheric Administration (NOAA) Nautical Charts incorporated by reference in the proposed amended Cruise Ship ATCM, there may be some oceangoing ships, which use different nautical charts. In this situation, although not a requirement, an oceangoing ship may wish to purchase the NOAA nautical charts to ensure that they

know the location of the Three Nautical Mile Line. A set of NOAA charts can be purchased for about $100.

No additional cost impacts were identified for the other changes affecting cruise ships as specified in Section A, part 6 of Chapter VI.

C. Potential Impact on Employment

The proposed amendments to the ATCM are not expected to cause a change in California employment because, based on ARB's Survey, prior to the effective date of SB 771, only three out of 395 (0.75 percent) oceangoing ships incinerated waste within three nautical miles of the California coast. If we assume that 0.75 percent of the 1,900 oceangoing ships that came to California in 2005 incinerated within three miles of the California coast then we can estimate that 14 ships incinerated within three miles of the California coast prior to the effective date of SB 771 (January 1, 2006). For these 14 oceangoing ships, a change in incinerator operating schedule is not expected to impose significant costs; therefore, it is unlikely to have any impact on employment. Additionally, since the garbage records are already required under Annex V, there is no impact expected on employment due to recordkeeping and reporting requirements of the proposed amended ATCM.

No impact on employment was identified for the other changes affecting cruise ships as specified in Section A, part 6 of Chapter VI.

D. Potential Impact on Business Creation, Elimination, or Expansion

Because costs for the proposed amendments are negligible, the proposed amended Cruise Ship ATCM is not expected to have an impact on the creation, elimination, or expansion of businesses and jobs in California.

E. Potential Impact on Business Competitiveness

The proposed amended Cruise Ship ATCM is not expected to have an impact on business competitiveness. The proposed amended Cruise Ship ATCM is consistent with current industry practices and the requirements are identical across all cruise ships and oceangoing ships, which travel to California ports.

F. Costs to Public Agencies

ARB staff evaluated the cost impacts to local, state, and federal agencies and determined there are no significant economic impacts.

1. Local Agencies

ARB staff did not identify any cruise ships or oceangoing vessels owned or operated by local agencies that meet the definition in the proposed regulation and conduct onboard incineration.

We do not expect significant fiscal impacts on local air pollution control agencies because ARB will enforce the proposed amended Cruise Ship ATCM.

2. State Agencies

In order to promote statewide consistency, ARB will have the responsibility for enforcing the proposed amended Cruise Ship ATCM. The ARB expects to be able to enforce the proposed amended Cruise Ship ATCM with existing resources in the current fiscal year. However, additional resources may be necessary in the future. To minimize costs, inspections may be conducted in conjunction with other ARB enforced marine vessel regulations such as the proposed regulation for auxiliary diesel engines and diesel electric engines.

The only other affected state agency or program identified was the California Maritime Academy (CMA) in Vallejo. The CMA operates the "Golden Bear" training vessel on an annual voyage. This vessel does not incinerate within three nautical miles of the California coast and it currently maintains garbage records as specified under MARPOL. Therefore, impact to this agency is minimal.

3. Federal Agencies

Military agencies (i.e., Navy and Coast Guard) operate a total of approximately 20 oceangoing vessels that call on California ports and conduct onboard incineration. USCG policy prohibits operation of incinerators within three nautical miles of the California coast, and the Navy prohibits incineration within 12 nautical miles of the California coast. In the proposed amended Cruise Ship ATCM military agencies are required to keep incineration records within three nautical miles of the California coast. It is expected that these costs would be negligible, since the proposed regulation prohibits onboard incineration within this zone, and military policy also prohibits incinerator use in this zone.

VIII. ENVIRONMENTAL IMPACTS OF THE PROPOSED AMENDED CRUISE SHIP ATCM

The intent of the proposed amended Cruise Ship ATCM is to protect the public health by reducing the public's exposure to toxic air contaminants (TACs) from incineration onboard oceangoing ships. ARB staff evaluated potential water quality impacts, potential increase in diesel emissions, diversion of waste to landfills or land-based municipal waste incinerators, and public health impacts from storing garbage. ARB staff has determined that no significant adverse environmental impacts are expected to occur.

A. Legal Requirements Applicable to the Analysis

The California Environmental Quality Act (CEQA) and ARB policy require an analysis to determine the potential adverse environmental impacts of proposed regulations. The ARB's program involving the adoption of regulations has been certified by the Secretary of Resources (see Public Resources Code section 21080.5). Therefore, the CEQA environmental analysis requirements may be included in the Initial Statement of Reasons for a rulemaking in lieu of preparing an environmental impact report or negative declaration. In addition, ARB will respond in writing to all significant environmental issues 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 amended Cruise Ship ATCM.

Public Resources Code section 21159 requires that the environmental impact analysis conducted by ARB include the following: (1) an analysis of the reasonably foreseeable environmental impacts of the methods of compliance; (2) an analysis of reasonably foreseeable feasible mitigation methods; and, (3) an analysis of reasonably foreseeable alternative means of compliance with the proposed revisions to the ATCM. Regarding reasonably foreseeable mitigation measures, CEQA requires an agency to identify and adopt feasible mitigation measures that would minimize any significant adverse environmental impacts described in the environmental analysis.

B. Potential Ocean Water Quality Impacts

Since oceangoing ships would be prohibited from incinerating waste within three nautical miles of the California Coast, we do not expect any impact to the ocean water quality close to shore. Oceangoing ships are already prohibited from dumping wastes within three nautical miles of the coast (IMO, 1997). A prohibition against incineration in this same zone would not impact ocean water quality.

As cruise ships are already prohibited from dumping wastes within three nautical miles of the coast (IMO, 1997), amending the definition of "cruise ship," to mean those cruise ships calling on California ports or places, is not expected to impact ocean water quality.

C. Diesel Emissions

A negligible increase in diesel emissions could occur. By extrapolating from our Survey, we assume that 14 (0.75 percent) of the 1,900 oceangoing ships that came to California in 2005 incinerated within three nautical miles of the California coast prior to the effective date of SB 771 (January 1, 2006). If these 14 oceangoing ships chose to have all or a portion of that waste picked up by solid waste collection vehicles which operate on diesel fuel, then, in this scenario, diesel emissions could occur from additional miles traveled by these vehicles. However, it is expected that incinerator operating schedules would be adjusted (e.g., oceangoing ships would incinerate after they were outside of the three nautical mile line) rather than having their waste picked up by solid waste collection vehicles. This is because onshore waste pick up may incur additional costs, whereas adjusting the incinerator operating schedules would most likely not.

Amending the definition of "cruise ship," to mean those cruise ships calling on California ports or places, is not expected to impact diesel emissions since cruise ships are currently prohibited from incinerating within three nautical miles of the California coast.

D. Landfills and Land-Based Municipal Waste Incinerators

A negligible increase in solid waste to landfills or land-based municipal waste incinerators could occur if the small number of oceangoing ships which incinerated within three nautical miles of the California coast prior to January 1, 2006, chose to have that portion of their waste go to landfills or get picked up at a port for incineration at a land-based municipal waste incineration facility. For the three ships which reported incinerating within three nautical miles of the California coast, the waste they incinerated within three nautical miles of the California coast makes up less than 0.01 percent of each of their total waste incinerated.

Based on our extrapolation from Survey data, we estimate that 14 oceangoing ships could have incinerated waste within three nautical miles of the California coast prior the effective date of SB 771. Any additional waste going to landfills or land-based municipal waste incinerators would be negligible compared to the large volume received from local residents and businesses. Additionally, the nearest land-based municipal waste incinerators to the heaviest traveled ports of Los Angeles and Long Beach are equipped with sophisticated air pollution control devices. However, it is expected that incinerator operating schedules would be adjusted (e.g., oceangoing ships would incinerate after they were outside of the three nautical mile line) rather than have an additional portion of the waste diverted to landfills or land-based municipal waste incinerators.

Amending the definition of "cruise ship," to mean those cruise ships calling on California ports or places, is not expected to increase the amount of solid waste sent to

landfills or land-based municipal waste incinerators since cruise ships are currently prohibited from incinerating within three nautical miles of the California coast.

E. Waste Storage

Because the proposed amended Cruise Ship ATCM limits when oceangoing ship owners or operators may conduct onboard incineration, ARB staff evaluated whether this would result in infestation of plant and animal pests and diseases due to holding or stockpiling regulated garbage. Regulated garbage is defined in Code of Federal Regulations (CFR), Title 7 CFR, section 330.400 and Title 9 CFR, section 94.5. Some examples of regulated garbage onboard an oceangoing ship would include food scraps, table refuse, galley refuse, food wrappers or packaging materials, and other waste material from stores and food preparation. All regulated international garbage within the territories of the United States must be in leak-proof, covered containers to prevent the dissemination of plant and animal pests and diseases (ARB, 2005b).

Although there are no requirements on how long regulated garbage may be stored on an oceangoing ship, the United States Department of Agriculture (USDA) has requirements for regulated garbage on land. In California and other similar climates and agricultural areas, USDA has allowed up to 72 hours (based on the life cycles of various plant pests in those climates) for storing garbage. Additional holding times are granted on a case by case basis (ARB, 2005b).

ARB staff does not expect negative environmental impacts due to the potential for garbage storage from the proposed amended Cruise Ship ATCM. In addition, it is not expected that a large amount of regulated garbage would be generated while coming into port, hoteling, or leaving the port. While at port, oceangoing ships may either send their wastes to landfills, land-based municipal waste incinerators, or can store their international regulated waste in leak-proof, covered containers. Many ships reported that a portion of their waste is disposed of at port facilities.

Amending the definition of "cruise ship," to mean those cruise ships calling on California ports or places, is not expected to impact waste storage since cruise ships are currently prohibited from incinerating within three nautical miles of the California coast.

F. Reasonably Foreseeable Alternative Means of Compliance with the Proposed Amended Cruise Ship ATCM

ARB is required to do an analysis of reasonably foreseeable alternative means of compliance with the proposed amended Cruise Ship ATCM. Alternatives to the proposed amended Cruise Ship ATCM are discussed in Chapter VI. ARB staff has concluded that the proposed amended Cruise Ship ATCM provides clarity in implementing SB 771 and AB 771. The ATCM is enforceable with the least burdensome approach to reducing public health impacts from oceangoing ship and cruise ship onboard incineration.

G. Environmental Justice

The ARB is committed to evaluating community impacts of proposed regulations including environmental justice concerns. Because some communities experience higher exposure to toxic pollutants, it is a priority of ARB to ensure that full protection is afforded to all Californians. The proposed amended Cruise Ship ATCM is not expected to result in significant negative impacts in any community. The proposed amended Cruise Ship ATCM is designed to reduce emissions of TACs, such as polychlorinated dibenzo-*p*-dioxins (dioxins), polychlorinated dibenzofurans (furans), and metals to residents and off-site workers living or working along the California coast and near California ports.

IX. REFERENCES

APHIS, 2005. Regulation of certain garbage. Code of Federal Regulations (CFR), title 9, section 94.5. United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS). September 2005.

ARB, 2005a. Staff Report: Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for Cruise Ship Onboard Incineration, California Air Resources Board, September 30, 2005.

ARB, 2005b. E-mail from Cheryl L. Berthoud, Animal and Plant Health Inspection Service, June 27, 2005.

ARB, 2005c. Cruise Ship Onboard Incinerator Survey, California Air Resources Board, April 2005.

ARB, 2005d. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Proposed Regulation for Auxiliary Diesel Engines and Diesel-Electric Engines Operated on Ocean-going Vessels within California Waters and 24 Nautical Miles of the California Baseline, California Air Resources Board, October 2005.

ARB, 2006. Oceangoing Ship Onboard Incinerator Survey, California Air Resources Board, May 2006.

CSLC, 2005. California State Lands Commission. Invasive Species Database. 2005.

IMO, 1997. Guidelines for the Implementation of Annex V of MARPOL 73/78. Page 9. International Maritime Organization. 1997.

IMO, 1998. Annex VI of MARPOL 73/78: Regulations for the Prevention of Air Pollution from Ships and NO_X Technical Code. Regulation 16: Shipboard incineration. International Maritime Organization. 1998.

NOAA, 2000-2005. National Oceanic and Atmospheric Administration (NOAA) Nautical Charts, as authored by the NOAA Office of Coast Survey.

- Chart 18600, Trinidad Head to Cape Blanco (January 2002);
- Chart 18620, Point Arena to Trinidad Head (June 2002);
- Chart 18640, San Francisco to Point Arena (August 2005);
- Chart 18680, Point Sur to San Francisco (June 2005);
- Chart 18700, Point Conception to Point Sur (July 2003);
- Chart 18720, Point Dume to Purisima Point (January 2005); and
- Chart 18740, San Diego to Santa Rosa Island (April 2005).

USCG, 2005. Implementation of MARPOL 73/78 and the Protocol on Environmental Protection to the Antarctic Treaty as it Pertains to Pollution from Ships. United States Coast Guard. Code of Federal Regulations, title 33, subpart A, part 151.51-151.79.

Appendix A

Proposed Amended Regulation Order

Airborne Toxic Control Measure
for Cruise Ship and Oceangoing Ship Onboard Incineration

PROPOSED REGULATION ORDER

AIRBORNE TOXIC CONTROL MEASURE AMENDMENTS LIMITING ONBOARD INCINERATION ON CRUISE SHIPS AND OCEANGOING SHIPS

Amend ~~Adopt new~~ section 93119, title 17, California Code of Regulations, to read as follows:

Section 93119. Airborne Toxic Control Measure Limiting Onboard Incineration ~~for~~ on Cruise Ships and Oceangoing Ships ~~Onboard Incineration~~.

(a) Purpose.

The purpose of this control measure is to reduce emissions of toxic air contaminants from the use of incinerators aboard cruise ships and oceangoing ships. Specifically, this regulation prohibits cruise ships and oceangoing ships from conducting onboard incineration while operating within three miles of the California coast. This control measure is expected to reduce exposure to toxic air contaminants for residents living near ports and along the California coast.

(b) Applicability.

~~Except as provided in subsection (c),~~ Tthis section applies to any person who owns or operates a cruise ship, as defined in subsection (c)~~(d)~~(2), including foreign flagged cruise ships~~,~~. ~~which travel within three miles of the California coast or visit California ports or terminals.~~

This section also applies to any person who owns or operates an oceangoing ship as defined in subsection (c)(6), including foreign flagged oceangoing ships.

~~**(c) Exemptions.**~~

~~(1) This section does not apply to vessels without berths or overnight accommodations for passengers.~~

~~(2) This section does not apply to noncommercial vessels, warships, vessels operated by nonprofit entities as determined by the Internal Revenue Service, and vessels operated by the State of California, the United States, or a federal government.~~

(cd) Definitions. For the purposes of this section, the following definitions apply:

~~(1) "Air Pollution Control Officer" or "APCO" means the air pollution control or executive officer of a district, or his or her delegate~~.

(1) "Calling on California ports or places" means bound for or leaving a port or terminal located in California.

(2) "Cruise ship" means a commercial vessel which has berths or overnight accommodations for passengers and ~~that~~ which has the capacity to carry 250 or more passengers for hire, calling on California ports or places. Cruise ship does not include an oceangoing ship, noncommercial vessels, warships, vessels operated by nonprofit entities as determined by the Internal Revenue Service, and vessels operated by the State of California, the United States, or a foreign government.

~~(3) "District" means an air pollution control or air quality management district as defined in Health and Safety Code section 39025.~~

(3) "Estuarine Waters" means an arm of the sea or ocean that extends inland to meet the mouth of a river.

(4) "Executive Officer of the Air Resources Board" means the executive officer of the California Air Resources Board or his or her delegate.

(5) "Incinerator" means any device used to conduct onboard incineration.

(6) "Oceangoing Ship" means a private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places. An oceangoing ship does not include a cruise ship.

(6~~7~~) "Onboard incineration" means the combustion or burning of any materials or wastes for the purpose of volume reduction, destruction, sanitation, or sterilization, aboard a cruise ship or oceangoing ship. Onboard incineration does not include incinerators which are only burning fuels including, but not limited to, natural gas, gas oil, marine gas oil, marine diesel fuel, fuel oil, or residual fuel oil for the specific purpose of maintaining a minimum temperature in the incinerator to minimize thermal cycling.

(~~7~~8) "Owner or Operator" means a person who owns or operates a cruise ship or oceangoing ship.

(~~8~~9) "Person" shall have the same meaning as defined in Health and Safety Code section 39047.

(10) "Regulated California Waters" means all of the following:

(A) all California internal waters;
(B) all California estuarine waters;

(C) all California ports, roadsteads, and terminal facilities (collectively "ports");

(D) all waters within 3 nautical miles of the California baseline, starting at the California-Oregon border and ending at the California-Mexico border at the Pacific Ocean, inclusive;

(E) all waters within 12 nautical miles of the California baseline, starting at the California-Oregon border and ending at the California-Mexico border at the Pacific Ocean, inclusive;

(F) all waters within 24 nautical miles of the California baseline, starting at the California-Oregon border to 34.43 degrees North, 121.12 degrees West; inclusive; and

(G) all waters within the area, not including any islands, between the California baseline and a line starting at 34.43 degrees North, 121.12 degrees West; thence to 33.50 degrees North, 118.58 degrees West; thence to 32.48 degrees North, 117.67 degrees West; and ending at the California-Mexico border at the Pacific Ocean, inclusive.

~~(9) "Segment" means that portion of the cruise ship's voyage from the last port of call to the next port of call.~~

(~~10~~11) "Within three miles of the California coast" means between the California coast and the Three Nautical Mile Line as shown on the following National Oceanic and Atmospheric Administration (NOAA) Nautical Charts as authored by the NOAA Office of Coast Survey, which are incorporated herein by reference:

(A) Chart 18600, Trinidad Head to Cape Blanco (January 2002);
(B) Chart 18620, Point Arena to Trinidad Head (June 2002);
(C) Chart 18640, San Francisco to Point Arena (August 2005);
(D) Chart 18680, Point Sur to San Francisco (June 2005);
(E) Chart 18700, Point Conception to Point Sur (July 2003);
(F) Chart 18720, Point Dume to Purisima Point (January 2005); and
(G) Chart 18740, San Diego to Santa Rosa Island (April 2005).

(de) Requirements.

(1) Notwithstanding sections 93104 and 93113 of title 17, California Code of Regulations, no cruise ship or oceangoing ship owner or operator, agent, representative, or employee shall conduct onboard incineration within three miles of the California coast, except when required to be operated under the direction or supervision of the United States Coast Guard.

(2) *Recordkeeping and Reporting Requirements*

(A) *Recordkeeping Requirements*

1. Except as provided in subsection (d)(2)(A)4a, ~~Owners~~ owners or operators of cruise ships or oceangoing ships subject to the requirements of this section shall ~~maintain~~ record the following ~~records~~ information while the incinerator is operating in Regulated California Waters: ~~for each segment of a voyage if, during any portion of that segment, the cruise ship travels within three miles of the California coast~~.

    a. The date and time of start and stop of incineration (in local time);
    b. The position of the ship in latitude and longitude for each start and stop time of incineration;
    c. The estimated amount incinerated in cubic meters (m^3); ~~and~~
    d. The name or signature of officer in charge of the operation.~~;~~ and
    e. When operation of the incinerator is required by the United States Coast Guard, the name, unit, and phone number of United States Coast Guard personnel who directed that the incinerator be operated.

2. Records shall be maintained in English and shall be kept and maintained onboard the respective cruise ship or oceangoing ship for two years.

3. During an onboard inspection, records shall be made available to Air Resources Board personnel, ~~District personnel,~~ or their delegates.

4. Recordkeeping Requirements for Military Vessels.

    a. Military agencies owning or operating an oceangoing ship subject to the requirements of this section shall record the information listed in subsection (d)(2)(A)1a-e while the incinerator is operating within three miles of the California coast.

(B) *Reporting Requirements*

1. Owners or operators of cruise ships and oceangoing ships that are subject to this section, shall, upon written request by the Executive Officer of the Air Resources Board ~~or the Air~~

~~Pollution Control Officer from a District~~, provide copies of the records as specified in subsection (d)~~(e)~~(2)(A) within 30 calendar days of the request.

2. Owners or operators of oceangoing ships owned or operated by a military agency, that are subject to this section, shall, upon written request by the Executive Officer of the Air Resources Board provide copies of the records as specified in subsection (d)(2)(A)4a within 30 calendar days of the request.

(e~~f~~) Updates to NOAA Charts.

The Executive Officer shall publish in the California Regulatory Notice Register, send an electronic notice out to all subscribers of the oceangoing ship incineration list serve and cruise ship incineration list serve, post to the oceangoing ship incineration website at www.arb.ca.gov/toxics/shipincin/shipincin.htm, and notify potentially affected cruise ship owners or operators, regarding revisions to subsection (c)~~(d)~~(~~10~~11) with regard to Nautical Charts updated by NOAA, at least 30 days before the updates take effect in the following situations:

(1) The Executive Officer may revise subsection (c)~~(d)~~(~~10~~11) when there is a change in the chart number or name; or

(2) The Executive Officer may revise subsection (c)~~(d)~~(~~10~~11) when NOAA revises the Three Nautical Mile Line, as shown on the respective charts.

(f~~g~~) Severability.

Each part of this section shall be deemed severable, and in the event that any part of this section is held to be invalid, the remainder of this section shall continue in full force and effect.

NOTE: Authority cited: Sections 39516, 39600, 39601, 39631, 39632, 39650, 39656, 39658, 39659, ~~and~~ 39666, and 41510 Health and Safety Code. Reference: Sections 39630, 39631, 39632, 39650, 39656, 39659, 39666, ~~and~~ 41700, and 41806 Health and Safety Code.

Appendix B

Appendix to Annex V of MARPOL 73/78

Appendix to Annex V

Form of Garbage Record Book

Name of ship: _____

Distinctive number or letters: _____

IMO No.: _____

Period: From: _____ To: _____

1 *Introduction*

In accordance with regulation 9 of Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), a record is to be kept of each discharge operation or completed incineration. This includes discharges at sea, to reception facilities, or to other ships.

2 *Garbage and garbage management*

Garbage includes all kinds of food, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of the vessel and liable to be disposed of continuously or periodically except those substances which are defined or listed in other annexes to MARPOL 73/78 (such as oil, sewage or noxious liquid substances).

The Guidelines for the Implementation of Annex V of MARPOL 73/78* should also be referred to for relevant information.

3 *Description of the garbage*

The garbage is to be grouped into categories for the purposes of this record book as follows:

1 Plastics

2 Floating dunnage, lining, or packing material

3 Ground-down paper products, rags, glass, metal, bottles, crockery, etc.

4 Paper products, rags, glass, metal, bottles, crockery, etc.

5 Food waste

* Refer to the Guidelines for the Implementation of Annex V of MARPOL 73/78; see IMO sales publication IMO-656E.

6 Incinerator ash.

4 *Entries in the Garbage Record Book*

4.1 Entries in the Garbage Record Book shall be made on each of the following occasions:

(a) When garbage is discharged into the sea:
  (i) Date and time of discharge
  (ii) Position of the ship (latitude and longitude)
  (iii) Category of garbage discharged
  (iv) Estimated amount discharged for each category in cubic metres
  (v) Signature of the officer in charge of the operation.

(b) When garbage is discharged to reception facilities ashore or to other ships:
  (i) Date and time of discharge
  (ii) Port or facility, or name of ship
  (iii) Category of garbage discharged
  (iv) Estimated amount discharged for each category in cubic metres
  (v) Signature of officer in charge of the operation.

(c) When garbage is incinerated:
  (i) Date and time of start and stop of incineration
  (ii) Position of the ship (latitude and longitude)
  (iii) Estimated amount incinerated in cubic metres
  (iv) Signature of the officer in charge of the operation.

(d) Accidental or other exceptional discharges of garbage
  (i) Time of occurrence
  (ii) Port or position of the ship at time of occurrence
  (iii) Estimated amount and category of garbage
  (iv) Circumstances of disposal, escape or loss, the reason therefor and general remarks.

4.2 Receipts

The master should obtain from the operator of port reception facilities, or from the master of the ship receiving the garbage, a receipt or certificate specifying the estimated amount of garbage transferred. The receipts or certificates must be kept on board the ship with the Garbage Record Book for two years.

4.3 Amount of garbage

The amount of garbage on board should be estimated in cubic metres, if possible separately according to category. The Garbage Record Book contains many references to estimated amount of garbage. It is recognized

that the accuracy of estimating amounts of garbage is left to interpretation. Volume estimates will differ before and after processing. Some processing procedures may not allow for a usable estimate of volume, e.g. the continuous processing of food waste. Such factors should be taken into consideration when making and interpreting entries made in a record.

RECORD OF GARBAGE DISCHARGES

Ship's name: _____ Distinctive No., or letters: _____ IMO No.: _____

Garbage categories:

1: Plastic.
2: Floating dunnage, lining, or packing materials.
3: Ground paper products, rags, glass, metal, bottles, crockery, etc.
4: Paper products, rags, glass, metal, bottles, crockery, etc.
5: Food waste.
6: Incinerator ash.

NOTE: THE DISCHARGE OF ANY GARBAGE OTHER THAN FOOD WASTE IS PROHIBITED IN SPECIAL AREAS. ONLY GARBAGE DISCHARGED INTO THE SEA MUST BE CATEGORIZED. GARBAGE OTHER THAN CATEGORY 1 DISCHARGED TO RECEPTION FACILITIES NEED ONLY BE LISTED AS A TOTAL ESTIMATED AMOUNT.

Date/time	Position of the ship	Estimated amount discharged into sea (m^3)					Estimated amount discharged to reception facilities or to other ship (m^3)		Estimated amount incinerated (m^3)	Certification/ Signature
		CAT. 2	CAT. 3	CAT. 4	CAT. 5	CAT. 6	CAT. 1	Other		

Master's signature: _____ Date: _____

Appendix C

Annex VI of MARPOL 73/78 – Regulation 16 and Appendix IV

Regulation 16
Shipboard incineration

(1) Except as provided in paragraph (5), shipboard incineration shall be allowed only in a shipboard incinerator.

(2) (a) Except as provided in sub-paragraph (b) of this paragraph, each incinerator installed on board a ship on or after 1 January 2000 shall meet the requirements contained in appendix IV to this Annex. Each incinerator shall be approved by the Administration taking into account the standard specifications for shipboard incinerators developed by the Organization.*

(b) The Administration may allow exclusion from the application of sub-paragraph (a) of this paragraph to any incinerator which is installed on board a ship before the date of entry into force of the Protocol of 1997, provided that the ship is solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the State the flag of which the ship is entitled to fly.

(3) Nothing in this regulation affects the prohibition in, or other requirements of, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, as amended, and the 1996 Protocol thereto.

(4) Shipboard incineration of the following substances shall be prohibited:

(a) Annex I, II and III cargo residues of the present convention and related contaminated packing materials;

(b) polychlorinated biphenyls (PCBs);

* Refer to resolution MEPC 76(40), Standard specification for shipboard incinerators.

(c) garbage, as defined in Annex V of the present Convention, containing more than traces of heavy metals; and

(d) refined petroleum products containing halogen compounds.

(5) Shipboard incineration of sewage sludge and sludge oil generated during the normal operation of a ship may also take place in the main or auxiliary power plant or boilers, but in those cases, shall not take place inside ports, harbours and estuaries.

(6) Shipboard incineration of polyvinyl chlorides (PVCs) shall be prohibited, except in shipboard incinerators for which IMO Type Approval Certificates have been issued.

(7) All ships with incinerators subject to this regulation shall possess a manufacturer's operating manual which shall specify how to operate the incinerator within the limits described in paragraph 2 of appendix IV to this Annex.

(8) Personnel responsible for operation of any incinerator shall be trained and capable of implementing the guidance provided in the manufacturer's operating manual.

(9) Monitoring of combustion flue gas outlet temperature shall be required at all times and waste shall not be fed into a continuous-feed shipboard incinerator when the temperature is below the minimum allowed temperature of 850°C. For batch-loaded shipboard incinerators, the unit shall be designed so that the temperature in the combustion chamber shall reach 600°C within five minutes after start-up.

(10) Nothing in this regulation precludes the development, installation and operation of alternative design shipboard thermal waste treatment devices that meet or exceed the requirements of this regulation.

Appendix IV

Type approval and operating limits for shipboard incinerators (Regulation 16)

(1) Shipboard incinerators described in regulation 16(2) shall possess an IMO type approval certificate for each incinerator. In order to obtain such certificate, the incinerator shall be designed and built to an approved standard as described in regulation 16(2). Each model shall be subject to a specified type approval test operation at the factory or an approved test facility, and under the responsibility of the Administration, using the following standard fuel/waste specification for the type approval test for determining whether the incinerator operates within the limits specified in paragraph (2) of this appendix:

Sludge oil consisting of:	75% Sludge oil from HFO; 5% waste lubricating oil; and 20% emulsified water
Solid waste consisting of:	50% food waste 50% rubbish containing approx. 30% paper, " 40% cardboard, " 10% rags, " 20% plastic The mixture will have up to 50% moisture and 7% incombustible solids.

(2) Incinerators described in regulation 16(2) shall operate within the following limits:

O_2 in combustion chamber:	6–12%
CO in flue gas maximum average:	200 mg/MJ
Soot number maximum average:	Bacharach 3 or Ringelman 1 (20% opacity) (A higher soot number is acceptable only during very short periods such as starting up)
Unburned components in ash residues:	maximum 10% by weight
Combustion chamber flue gas outlet temperature range:	850–1200°C

Appendix D

Oceangoing Ship Onboard Incinerator Survey

California Environmental Protection Agency

Air Resources Board

Oceangoing Ship Onboard Incinerator Survey

(Please type or print legibly in ink)

A. Company Information

A.1. Company Name:_____

A.2. Mailing Address: _____

_____

_____

A.3. Contact person: _____

A.4. Phone number with area code:_____

A.5. E-mail address_____A.6. fax number_____

A.7. Certification: I am an officer of the company listed above and hereby certify that all information entered by my company on this "Oceangoing Ship Onboard Incineration Survey" is complete and accurate to the best of my knowledge and belief.	
Print Name:	Title:
Signature:	Date:

B. Oceangoing Ship Information

B.1. Vessel Name_____ B.2. IMO or Official Number_____

B.3. Vessel Type (circle one) **Auto Bulk Container General Military Tanker Unmanned Barge Other**_____

B.4. Country Flag:_____ B.5. Gross Tonnage (Metric Ton) _____

B.6. Typical or required number of crew_____

B.7. Number of incinerators onboard this vessel ____

If there are no incinerators onboard this vessel then place a "0" or write "none" in the space above (do not leave blank). You do not need to complete the remainder of the Survey. You are only required to complete and return page 1 of the Survey.

NOTE: IF THERE IS MORE THAN ONE ONBOARD INCINERATOR FOR THIS OCEANGOING SHIP PLEASE PHOTOCOPY THE REMAINDER OF THIS SURVEY AND FILL OUT THE INFORMATION FOR EACH INCINERATOR.

C. Waste and Incinerator Information

C.1. Incinerator manufacturer and model _____
(Please attach manufacturer specifications, if available)

C.2. Please check the type of fuel that is used to run the incinerator?

- ❑ Marine Diesel Oil
- ❑ Marine Gas Oil
- ❑ Heavy Fuel Oil (IFO 180, 380)
- ❑ Sludge Oil
- ❑ Other_____

C.3. Estimate the fuel use during incineration _____(specify units, e.g. gallons/hr)

C.4. Is the incinerator kept on when it is not burning waste?

- ❑ Yes
- ❑ No (if No, skip to C.6.)

C.5. If you answered yes to C.4., estimate the fuel use when the incinerator is not burning waste but is kept on (for the purpose of minimizing start-up and shut-down).
_____(specify units, e.g., gallons/hour)

C.6. Please check below the types of waste that are incinerated onboard this vessel (check all that apply).

- ❑ Plastics (including light plastics)
- ❑ Floating dunnage, lining, or packing material
- ❑ Paper products
- ❑ Rags
- ❑ Glass, metal, bottles, crockery, etc.
- ❑ Food waste
- ❑ Other_____

C.7. For the year 2005, approximately how much waste was burned in this incinerator?
_____tons/year OR _____ cubic meters/year (m^3/yr)

C.8. For the year 2005, estimate the amount of waste that was incinerated within three miles of the California Coast (including while at California ports).
_____ tons/year OR _____ m^3/year

C.9. Do you currently maintain a garbage record log as specified by Annex V of MARPOL 73/78?

- ❑ Yes
- ❑ No

C.10. During what hours do you typically burn waste in the incinerator?

- ☐ Daytime
- ☐ Nighttime
- ☐ Anytime

C.11. Manufacturer waste and/or material capacity for this incinerator. (If available, include manufacturer literature)

_____pounds/hour
_____other, specify units

C.12. What is the stack gas temperature during incineration? _____ (specify units, e.g., °K, °C)

C.13. What is the inside diameter of the incinerator stack?_____ (specify units, e.g., meters, inches)

C.14. What is the approximate distance from the design draft water line of the ship to the top of the incinerator stack? _____(specify units, e.g., meters, feet)

C.15. What is the stack velocity or the stack flow rate during incineration?
_____(specify units, e.g. m/s, ft/s, m^3/hr)

C.16. Does the incinerator have any of the following air pollution add-on controls (check all that apply)? (If available, please include manufacturer specifications or literature)

- ☐ None
- ☐ Wet collectors (scrubbers, e.g. spray towers, venturi scrubbers)
- ☐ Dry scrubber
- ☐ Baghouse
- ☐ Electrostatic precipitator
- ☐ Carbon adsorption
- ☐ Cyclone
- ☐ Other (please list)_____

C.17. Has emissions testing ever been conducted on your incinerator?

- ☐ Yes (please provide this information)
- ☐ No

C.18. Is the incinerator a batch, continuous, or intermittent incinerator according to the definitions below?

- ☐ Batch: an incinerator that is designed such that neither waste charging nor ash removal can occur during combustion. (skip to C.21)
- ☐ Continuous: an incinerator that is designed to allow waste charging and ash removal during combustion. (proceed to C.19)
- ☐ Intermittent: an incinerator that is designed to allow waste charging, but not ash removal, during combustion. (proceed to C.19)

CONTINUOUS OR INTERMITTENT OPERATION QUESTIONS

C.19. How many pounds (lbs) or cubic meters (m^3) of waste do you typically burn per hour?
_____pounds/hour (lbs/hr); or _____cubic meters/hour (m^3/hr)

C.20. How many hours do you burn waste in the incinerator per day?_____hours/day

****Skip to D.**

BATCH OPERATION QUESTIONS

C.21. How many pounds (lbs) or cubic meters (m^3) of waste do you burn in the incinerator per batch? _____ pounds/batch (lbs/batch); or _____cubic meters/batch (m^3/batch)

C.22. How long (in minutes or hours) does it take to burn the waste of the batch specified in your answer for question C.21?_____(specify units, e.g. hours, minutes)

C.23. What is the maximum number of batches incinerated per day?_____batches/day

C.24. How many days per week do you incinerate batches of waste?_____days/week

D. Other Waste Treatment

D.1 Besides incineration, briefly describe any other methods of waste treatment or disposal you do either in or out of port (e.g., recycling, disposal to port facilities, discharge to sea, etc.)

_____

_____

_____

_____

_____

_____

_____

_____

****END OF SURVEY****

****IF AVAILABLE, PLEASE ATTACH A COPY OF YOUR INCINERATOR SPECIFICATIONS, CONTROL EQUIPMENT, AND EMISSIONS TESTING, IF APPLICABLE****

Thank you for filling out this survey.
Submit completed form by email, fax, or mail by **June 12, 2006.** For email submittals send to mkomleni@arb.ca.gov, by fax to **(916) 327-6251 OR mail the survey back to the following address:**

Michelle Komlenic
Air Resources Board
Stationary Source Division
P.O. Box 2815
Sacramento, California 95812-2815

Additional copies of the survey can be found on our website at **www.arb.ca.gov/toxics/shipincin/shipincin.htm** or have any questions, please contact Ms. Michelle Komlenic, at (916) 322-3926 or via email at mkomleni@arb.ca.gov

Appendix E

Senate Bill 771

Senate Bill No. 771

CHAPTER 588

An act to amend Sections 39630, 39631, and 39632 of, and to amend the heading of Chapter 3.3 (commencing with Section 39630) of Part 2 of Division 26 of, the Health and Safety Code, and to amend Sections 72410, 72420, 72440, and 72441 of, to amend the heading of Division 38 (commencing with Section 72400) of, to amend and repeal Sections 72400 and 72430 of, to add Sections 72420.2, 72423, and 72440.1 to, to add and repeal Sections 72401 and 72420.1 of, to repeal Division 39 (commencing with Section 72500) of, and to repeal and add Sections 72421 and 72425 to, the Public Resources Code, relating to vessels.

[Approved by Governor October 6, 2005. Filed with Secretary of State October 6, 2005.]

LEGISLATIVE COUNSEL'S DIGEST

SB 771, Simitian. Oceangoing ships.

(1) Existing law prohibits a cruise ship, as defined, from conducting onboard incineration while operating within 3 miles of the California coast.

This bill would also prohibit an oceangoing ship, as defined, from conducting onboard incineration while operating within 3 miles of the California coast.

(2) Existing law regulates the release of graywater, sewage sludge, oily bilgewater, hazardous waste, or other waste by large passenger vessels into the marine waters of the state and marine sanctuaries. Existing law also regulates, until January 1, 2010, the release of sewage by large passenger vessels into the marine waters of the state.

This bill would also regulate the release of graywater, sewage, sewage sludge, oily bilgewater, hazardous waste, or other waste by oceangoing ships, as defined, into the marine waters of the state and marine sanctuaries.

The bill would require the master, owner, operator, agent, or person in charge of an oceangoing ship who has operated, or has caused to be operated, the oceangoing ship in the marine waters of the state during 2006, to provide certain information relating to ports of call and sewage, graywater, and blackwater discharge, in electronic or written form to the State Lands Commission upon the vessel's departure from its first port or place of call in California beginning in 2006. The bill would require the commission to submit the reported information to the State Water Resources Control Board on or before February 1, 2007. The bill would require the board to submit the reported information to the Legislature on or beforeOctober 1, 2007.

This bill would also consolidate the provisions regulating the release of these substances from large passenger vessels and oceangoing ships.

The people of the State of California do enact as follows:

SECTION 1. This act shall be known and may be cited as the California Clean Coast Act.

SEC. 1.5. The heading of Chapter 3.3 (commencing with Section 39630) of Part 2 of Division 26 of the Health and Safety Code is amended to read:

CHAPTER 3.3. CRUISE SHIPS AND OCEANGOING SHIPS

SEC. 2. Section 39630 of the Health and Safety Code is amended to read:

39630. The Legislature finds and declares that it is in the interests of all Californians to protect the air quality from increasing volumes of cruise ship engine and oceangoing ship engine emissions.

SEC. 3. Section 39631 of the Health and Safety Code is amended to read:

39631. (a) The state board shall enforce this chapter, and may adopt standards, rules, and regulations for that purpose pursuant to Section 39601.

(b) As used in this division, "cruise ship" means a commercial vessel that has the capacity to carry 250 or more passengers for hire. "Cruise ship" does not include the following:

(1) Vessels without berths or overnight accommodations for passengers.

(2) Noncommercial vessels, warships, vessels operated by nonprofit entities as determined by the Internal Revenue Service, and vessels operated by the state, United States, or a foreign government.

(3) Oceangoing ships, as defined in subdivision (c).

(c) As used in this division, "oceangoing ship" means a private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places.

SEC. 4. Section 39632 of the Health and Safety Code is amended to read:

39632. Commencing on January 1, 2005, a cruise ship, and commencing on January 1, 2006, an oceangoing ship, shall not conduct onboard incineration while operating within three miles of the California coast, to the extent allowed by federal law.

SEC. 5. The heading of Division 38 (commencing with Section 72400) of the Public Resources Code is amended to read:

DIVISION 38. CALIFORNIA CLEAN COAST ACT

SEC. 6. Section 72400 of the Public Resources Code, as amended by Section 1 of Chapter 764 of the Statutes of 2004, is amended to read:

72400. The Legislature finds and declares both of the following:

(a) California is home to four of the 13 national marine sanctuaries. These areas support some of the world's most diverse marine ecosystems and are home to numerous mammals, seabirds, fish, invertebrates, and plants.

(b) The protection and enhancement of the quality of the marine waters of the state and marine sanctuaries, and the protection of public health and the environment, requires that the release from large passenger vessels and oceangoing ships of hazardous waste, other waste, sewage sludge, and oily bilgewater, into the marine waters of the state and marine sanctuaries, and the release of graywater by large passenger ships into the marine waters of the state, should be prohibited.

SEC. 7. Section 72400 of the Public Resources Code, as added by Chapter 764 of the Statutes of 2004, is repealed.

SEC. 8. Section 72401 is added to the Public Resources Code, to read:

72401. (a) The Legislature finds and declares that the protection and enhancement of the quality of the marine waters of the state requires that the release of sewage from large passenger vessels, and the release of sewage and graywater from oceangoing ships with sufficient holding tank capacity, into the marine waters of the state should be prohibited.

(b) The Legislature intends to request the Congress of the United States to amend the Federal Water Pollution Control Act (33 U.S.C. Sec. 1251 and following) to provide California with authority similar to that granted to the State of Alaska by Public Law 106-554, to regulate the release of sewage from large passenger vessels and oceangoing ships in the marine waters of the state.

(c) This section shall remain in effect only until January 1, 2010, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2010, deletes or extends that date.

SEC. 9. Section 72410 of the Public Resources Code is amended to read:

72410. (a) Unless the context otherwise requires, the definitions set forth in this section govern this division.

(b) "Board" means the State Water Resources Control Board.

(c) "Commission" means the State Lands Commission.

(d) "Graywater" means drainage from dishwasher, shower, laundry, bath, and washbasin drains, but does not include drainage from toilets, urinals, hospitals, or cargo spaces.

(e) "Hazardous waste" has the meaning set forth in Section 25117 of the Health and Safety Code, but does not include sewage.

(f) "Large passenger vessel" or "vessel" means a vessel of 300 gross registered tons or greater that is engaged in the carrying of passengers for hire, excluding all of the following vessels:

(1) Vessels without berths or overnight accommodations for passengers.

(2) Noncommercial vessels, warships, vessels operated by nonprofit entities as determined by the Internal Revenue Service, and vessels operated by the state, the United States, or a foreign government.

(3) Oceangoing ships, as defined in subdivision (j).

(g) "Marine waters of the state" means "coastal waters" as defined in Section 13181 of the Water Code.

(h) "Marine sanctuary" means marine waters of the state in the Channel Islands National Marine Sanctuary, Cordell Bank National Marine Sanctuary, Gulf of the Farallones National Marine Sanctuary, or Monterey Bay National Marine Sanctuary..

(i) "Medical waste" means medical waste subject to regulation pursuant to Part 14 (commencing with Section 117600) of Division 104 of the Health and Safety Code.

(j) "Oceangoing ship" means a private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places.

(k) "Oil" has the meaning set forth in Section 8750.

(*l*) "Oily bilgewater" includes bilgewater that contains used lubrication oils, oil sludge and slops, fuel and oil sludge, used oil, used fuel and fuel filters, and oily waste.

(m) "Operator" has the meaning set forth in Section 651 of the Harbors and Navigation Code.

(n) "Other waste" means photography laboratory chemicals, dry cleaning chemicals, or medical waste.

(o) "Owner" has the meaning set forth in Section 651 of the Harbors and Navigation Code.

(p) "Release" means discharging or disposing of wastes into the environment.

(q) "Sewage" has the meaning set forth in Section 775.5 of the Harbors and Navigation Code, including material that has been collected or treated through a marine sanitation device as that term is used in Section 312 of the Clean Water Act (33 U.S.C. Sec. 1322) or material that is a byproduct of sewage treatment.

(r) "Sewage sludge" has the meaning set forth in Section 122.2 of Title 40 of the Code of Federal Regulations.

(s) "Sufficient holding tank capacity" means a holding tank of sufficient capacity to contain sewage and graywater while the oceangoing ship is within the marine waters of the state.

(t) "Waste" means hazardous waste and other waste.

SEC. 10. Section 72420 of the Public Resources Code is amended to read:

72420. (a) If the appropriate federal agencies approve an application made pursuant to subdivision (a) of Section 72440, or if the board determines that an application is not required, an owner or operator of a large passenger vessel or oceangoing ship may not release, or permit anyone to release, any sewage sludge from the vessel into the marine waters of the state or a marine sanctuary.

(b) If the Administrator of the United States Environmental Protection Agency approves the application for sewage release made pursuant to subdivision (a) of Section 72440, or if the board determines that an application is not required, an owner or operator of an oceangoing ship with sufficient holding tank capacity may not release, or permit anyone to release, any sewage from the vessel into the marine waters of the state.

SEC. 11. Section 72420.1 is added to the Public Resources Code, to read:

72420.1. (a) If the Administrator of the United States Environmental Protection Agency approves the application for sewage release made pursuant to subdivision (a) of Section 72440, or if the board determines that an application is not required, an owner or operator of a large passenger vessel may not release, or permit anyone to release, any sewage from the vessel into the marine waters of the state.

(b) This section shall remain in effect only until January 1, 2010, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2010, deletes or extends that date.

SEC. 12. Section 72420.2 is added to the Public Resources Code, to read:

72420.2. (a) An owner or operator of a large passenger vessel shall not release, or permit anyone to release, from the vessel, graywater into the marine waters of the state.

(b) An owner or operator of a large passenger vessel or oceangoing ship shall not release, or permit anyone to release, from the vessel, hazardous waste, other waste, or oily bilgewater into the marine waters of the state or a marine sanctuary.

(c) An owner or operator of an oceangoing ship with sufficient holding tank capacity shall not release, or permit anyone to release, from the vessel, graywater into the marine waters of the state.

SEC. 13. Section 72421 of the Public Resources Code, as amended by Section 3 of Chapter 764 of the Statutes of 2004, is repealed.

SEC. 14. Section 72421 of the Public Resources Code, as added by Section 4 of Chapter 764 of the Statutes of 2004, is repealed.

SEC. 15. Section 72421 is added to the Public Resources Code, to read:

72421. (a) The owner or operator shall immediately, but no later than 24 hours after a release, notify the board of any of the following:

(1) A large passenger vessel release of graywater into the marine waters of the state.

(2) Until January 1, 2010, a large passenger vessel release of sewage into the marine waters of the state or a marine sanctuary.

(3) A large passenger vessel or ocean going ship release of hazardous waste, other waste, sewage sludge, or oily bilgewater into the marine waters of the state or a marine sanctuary.

(4) An oceangoing ship with sufficient holding tank capacity release of sewage or graywater into the marine waters of the state or a marine sanctuary.

(b) The owner or operator shall include all of the following in the notification required pursuant to subdivision (a):

(1) Date of the release.

(2) Time of the release.

(3) Location of the release.

(4) Volume of the release.

(5) Source of the release.

(6) Remedial action taken to prevent future releases.

SEC. 16. Section 72423 is added to the Public Resources Code, to read:

72423. An oceangoing ship with sufficient holding tank capacity and capability for transfer shall either hold on board or shall transfer sewage and graywater to a pumpout facility, if that facility is available and accessible for the oceangoing ship where the ship is docked, and shall not discharge sewage or graywater within California's waters.

SEC. 17. Section 72425 of the Public Resources Code is repealed.

SEC. 18. Section 72425 is added to the Public Resources Code, to read:

72425. (a) (1) If the master, owner, operator, agent, or person in charge of an oceangoing ship has operated, or has caused to be operated, the oceangoing ship in the marine waters of the state during 2006, that master, owner, operator, agent, or person in charge shall provide the information described in subdivision (b) in electronic or written form to the commission upon the vessel's departure from its first port or place of call in California beginning in 2006.

(2) The information described in subdivision (b) shall be submitted on a form developed by the commission.

(b) The master, owner, operator, or person in charge of the oceangoing vessel shall maintain on board the vessel, in written or electronic form, records that include all of the following information:

(1) Vessel information, including all of the following:

(A) Name.

(B) International Maritime Organization number or official number if the International Maritime Organization number has not been assigned.

(C) Vessel type.

(D) Owner or operator.

(E) Gross tonnage.

(F) Keel laid date.

(G) Port of registry.

(H) Typical or required number of crew.

(2) Graywater information, including the vessel's ability to store graywater while in California waters and size and capacity of any graywater holding tanks, as measured in metric tons.

(3) Blackwater information, including the vessel's ability to store blackwater while in California waters and size and capacity of any blackwater holding tanks, as measured in metric tons.

(4) Marine sanitation devices information, including number, size, and nature of devices on the vessel treating sewage prior to discharge.

(5) Connections to ensure transfer of sewage and graywater to pumpout facilities.

(6) California port of call information, including expected number of calls, in days, in ports within the state during 2006.

(7) Certification of accurate information, including the printed name, title, and signature of the master, owner, operator, or person in charge, or responsible officer attesting to the accuracy of the information provided.

(c) The commission shall submit the reported information to the board on or before February 1, 2007. The board shall submit the reported information to the Legislature on or before October 1, 2007. The board may submit the report to the Legislature in an electronic form.

SEC. 19. Section 72430 of the Public Resources Code, as amended by Section 6 of Chapter 764 of the Statutes of 2004, is amended to read:

72430. (a) A person who violates Section 72420 or 72420.2, or until January 1, 2010, Section 72420.1, is subject to a civil penalty of not more than twenty-five thousand dollars ($25,000) for each violation.

(b) The civil penalty imposed for each separate violation pursuant to this section is separate from, and in addition to, any other civil penalty imposed for a separate violation pursuant to this section or any other provision of law.

(c) In determining the amount of a civil penalty imposed pursuant to this section, the court shall take into consideration all relevant circumstances, including, but not limited to, the nature, circumstance, extent, and gravity of the violation. In making this determination, the court shall consider the degree of toxicity and volume of the release, the extent of harm caused by the violation, whether the effects of the violation may be reversed or mitigated, and with respect to the defendant, the ability to pay, the effect of a civil penalty on the ability to continue in business, all voluntary cleanup efforts undertaken, the prior history of violations, the gravity of the behavior, the economic benefit, if any, resulting from the violation, and all other matters the court determines justice may require.

(d) (1) A civil action brought under this section may only be brought in accordance with this subdivision. That civil action may be brought by the Attorney General upon complaint or request by the Department of Fish and Game or the appropriate California regional water quality control board, or by a district attorney or city attorney.

(2) Notwithstanding Section 13223 of the Water Code, a regional water quality control board may delegate to its executive officer authority to request the Attorney General for judicial enforcement under this section.

(3) If a district attorney or city attorney brings an action under this section, the action shall be in the name of the people of the State of California.

(4) An action relating to the same violation may be joined or consolidated.

SEC. 20. Section 72430 of the Public Resources Code, as added by Section 7 of Chapter 764 of the Statutes of 2004, is repealed.

SEC. 21. Section 72440 of the Public Resources Code, as amended by Section 8 of Chapter 764 of the Statutes of 2004, is amended to read:

72440. (a) (1) The board shall determine whether it is necessary to apply to the federal government for the state to prohibit the release of sewage or sewage sludge from large passenger vessels, and oceangoing ships with sufficient holding tank capacity, into the marine waters of the state or to prohibit the release of sewage sludge from large passenger vessels and oceangoing ships into marine sanctuaries, as described in subdivision (a) of Section 72420, subdivision (a) of Section 72420.1, and Section 72420.2. If the board determines that application is necessary for either sewage or sewage sludge, or both, it shall apply to the appropriate federal agencies, as determined by the board, to authorize the state to prohibit the release of sewage or sewage sludge, or both, as necessary, from large passenger vessels, and oceangoing ships with sufficient holding tank capacity, into the marine waters of the state and, if necessary, to authorize the state to prohibit the release of sewage sludge from large passenger vessels and oceangoing ships into marine sanctuaries.

(2) It is not the Legislature's intent to establish for the marine waters of the state a no discharge zone for sewage from all vessels, but only for a class of vessels.

(b) The board shall request the appropriate federal agencies, as determined by the board, to prohibit the release of sewage sludge and oily bilgewater, except under the circumstances specified in Section 72441, by large passenger vessels and oceangoing ships, in all of the waters that are in the Channel Islands National Marine Sanctuary, Cordell Bank National Marine Sanctuary, Gulf of the Farallones National Marine Sanctuary, and Monterey Bay National Marine Sanctuary, that are not in the state waters.

(c) This section shall remain in effect only until January 1, 2010, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2010, deletes or extends that date.

SEC. 22. Section 72440.1 is added to the Public Resources Code, to read:

72440.1. The board shall request the appropriate federal agencies, as determined by the board, to prohibit the release of waste by large passenger vessels or oceangoing ships in all of the waters in the Channel Islands National Marine Sanctuary, Cordell Bank National Marine Sanctuary, Gulf of the Farallones National Marine Sanctuary, and Monterey Bay National Marine Sanctuary; and, request, if necessary, approval of the state's prohibition of the release of waste in the marine sanctuaries.

SEC. 23. Section 72441 of the Public Resources Code is amended to read:

72441. (a) This division does not apply to either of the following:

(1) A large passenger vessel or oceangoing ship that operates in the marine waters of the state solely in innocent passage.

(2) Discharges made for the purpose of securing the safety of the large passenger vessel or oceangoing ship or saving life at sea, if reasonable precautions are taken for the purpose of preventing or minimizing the discharge.

(b) For the purposes of this section, a vessel is engaged in innocent passage if its operation in state waters would constitute innocent passage under either the Convention on the Territorial Sea and Contiguous Zone, dated April 29, 1958, or the United Nations Convention on the Law of the Sea, dated December 10, 1982.

SEC. 24. Division 39 (commencing with Section 72500) of the Public Resources Code is repealed.

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Appendix F

Potential Health Effects of Pollutants Emitted from Cruise Ship Onboard Incineration

Appendix F

Potential Health Effects of Pollutants Emitted from Oceangoing Ship Onboard Incineration

This section summarizes the cancer and noncancer health impacts that can result from exposure to pollutants emitted from oceangoing ship onboard incineration.

A. Arsenic (Inorganic)

Exposure to inorganic arsenic may result in both cancer and noncancer health effects. The probable route of human exposure to arsenic is by ingestion, inhalation, and permeation of skin or mucous membranes (ARB, 1997b).

1. Cancer

Evidence for carcinogenicity in humans due to inhaled arsenic is strong. Studies of workers in smelters and in the pesticide manufacturing industry have found strong, consistent associations between respiratory cancer and arsenic exposure. The effect on respiratory cancer rates of combining smoking and arsenic exposure appears to be greater than additive and at low doses may be as high as multiplicative (ARB, 1997b). Chronic exposure to high levels of arsenic in drinking water has been identified as increasing skin cancer incidence in humans (OEHHA, 2002).

The Office of Environmental Health Hazard Assessment (OEHHA) staff has performed an extensive assessment of the potential health effects of arsenic, reviewing available carcinogenicity data. OEHHA concluded that arsenic is a potential human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Air Resources Board (ARB/Board) formally identified arsenic as a toxic air contaminant (TAC) in July 1990 (ARB, 1990). Arsenic (inorganic arsenic compounds) was listed by the State of California under Proposition 65 as a carcinogen in February 1987 (OEHHA, 2005).

In 1990, the United States (U.S.) Congress listed arsenic as a hazardous air pollutant (HAP) in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The United States Environmental Protection Agency (U.S. EPA) has classified inorganic arsenic as Group A, human carcinogen, based on sufficient epidemiological evidence (U.S. EPA, 2005). The International Agency for Research on Cancer (IARC) has classified inorganic arsenic and arsenic compounds as Group 1: Human carcinogen based on sufficient evidence in humans (IARC, 2005). Arsenic in drinking-water is carcinogenic to humans (Group 1).

2. Noncancer

Acute inhalation exposure may result in severe irritation of the mucous membranes of the upper and lower respiratory tract with symptoms of cough, dyspnea, and chest pain. These may be followed by garlicky breath and gastrointestinal symptoms including vomiting and diarrhea. Signs of acute poisoning are dermatitis, nasal mucosal irritation, laryngitis, mild bronchitis, and conjunctivitis. The acute toxic symptoms of trivalent arsenic poisoning are due to severe inflammation of the mucous membranes and increased permeability of the capillaries. Inorganic arsenic compounds are easily absorbed through the skin; the trivalent is more rapidly absorbed than the pentavalent. Ingestion of two grams of arsenic trioxide was fatal to an adult male (OEHHA, 1999).

Persons with skin or respiratory conditions, including allergies, may be more sensitive to the toxic effects of arsenic. Persons with higher than normal intakes of arsenic, including smokers and fish and shellfish eaters, may be more sensitive to toxic effects following arsenic exposure (OEHHA, 1999).

Chronic inhalation exposure to inorganic arsenic in humans is associated with irritation of the skin and mucous membranes, while chronic oral exposure has resulted in gastrointestinal effects, anemia, peripheral neuropathy, skin lesions, and liver or kidney damage (ARB, 1997b).

Reports of human inhalation exposure to arsenic compounds, primarily epidemiological studies of smelter workers, indicate that adverse health effects occur as a result of chronic exposure. Among the targets of arsenic toxicity are the respiratory system, the circulatory system, the skin, the nervous system, and the reproductive system. Studies in experimental animals show that inhalation exposure to arsenic compounds can produce immunological suppression, developmental defects, and histological or biochemical effects on the nervous system and lung (OEHHA, 2000).

The oxidation state of arsenic determines the teratogenic potential of its inorganic compounds; trivalent (III) arsenic compounds possess greater teratogenic potential than pentavalent (V) compounds. Chronic exposure to arsenic has been associated with decreased birth weight and an increased rate of spontaneous abortion in female smelter workers. However, this association is confounded by the presence of other toxicants in the smelting process, including lead (OEHHA, 1999). Arsenic (inorganic oxides) was listed by the State of California under Proposition 65 as developmental toxicants in May 1997 (OEHHA, 2005).

B. Beryllium

Exposure to beryllium may result in both cancer and noncancer health effects. The probable routes of human exposure to beryllium are inhalation ingestion, and dermal contact (ARB, 1997b).

1. Cancer

Several studies found increased incidences of lung cancer in beryllium processing workers (OEHHA, 2002). Beryllium is a federal HAP and was identified as a toxic air contaminant by the Board in April 1993 under AB 2728 (ARB, 1993). The OEHHA staff has performed an extensive assessment of the potential health effects of beryllium, reviewing available carcinogenicity data. OEHHA concluded that beryllium is a potential human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. Beryllium and beryllium compounds were listed by the State of California under Proposition 65 as carcinogens in October 1987 (OEHHA, 2005).

In 1990, the U.S. Congress listed beryllium compounds as HAPs in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The U.S. EPA has classified beryllium as Group B1; probable human carcinogen (U.S. EPA, 2005). The International Agency for Research on Cancer has classified beryllium and beryllium compounds as Group 1: Human carcinogen (IARC, 2005).

2. Noncancer

Acute inhalation of high levels of beryllium can cause inflammation of the lungs in humans; these symptoms may be reversible after exposure ends (ARB, 1997b). The respiratory tract is the major target organ system in humans following the inhalation of beryllium. The common symptoms of chronic beryllium disease (CBD) include shortness of breath upon exertion, weight loss, cough, fatigue, chest pain, anorexia, and overall weakness. Most studies reporting adverse respiratory effects in humans involve occupational exposure to beryllium. Exposure to soluble beryllium compounds is associated with acute beryllium pneumonitis. Exposure to either soluble or insoluble beryllium compounds may result in obstructive and restrictive diseases of the lung, called chronic beryllium disease (berylliosis). The total number of beryllium-related disease cases has declined since the adoption of industrial standards (OEHHA, 2000).

C. Cadmium

Exposure to cadmium may result in both cancer and noncancer health effects. The probable routes of human exposure to cadmium are inhalation and ingestion (ARB, 1997b).

1. Cancer

Epidemiological evidence strongly supports an association between cadmium exposure and neoplasia, including respiratory and renal cancers. Cancer resulting from inhalation exposure to several forms of cadmium has been reported in animal studies (ARB, 1997b).

OEHHA staff has performed an extensive assessment of the potential health effects of cadmium and compounds, reviewing available carcinogenicity data. OEHHA concluded that cadmium and compounds are potential human carcinogens with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified cadmium and cadmium compounds as a TAC in January 1987 (ARB, 1986b). Cadmium and cadmium compounds were listed by the State of California under Proposition 65 as carcinogens in October 1987 (OEHHA, 2005).

In 1990, the U.S. Congress listed cadmium compounds as HAPs in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The U.S. EPA classified cadmium in Group B1: Probable human carcinogen, based on human and animal studies showing an increase of lung cancer (U.S. EPA, 2005). The International Agency for Research on Cancer classified cadmium and cadmium compounds in Group 1: Human carcinogen based on epidemiological evidence of carcinogenicity in humans and carcinogenic effects observed in animals (IARC, 2005). There is limited evidence in experimental animals for the carcinogenicity of cadmium metal (ARB, 1997b).

2. Noncancer

Although ingestion is the major source of exposure, only one to ten percent of ingested cadmium appears to be absorbed systemically. Pulmonary absorption of inhaled cadmium is estimated to range from 10 to 50 percent of deposited cadmium. The biological half-life of cadmium in humans has been estimated to range from 10 to 30 years. Cadmium has moderate acute toxicity, producing gastrointestinal or pulmonary irritation effects from ingestion or inhalation, respectively. Subchronic and chronic exposures to cadmium have been associated with renal, cardiovascular, endocrine, hepatic, bone, hematological, and immunological effects. Respiratory conditions include bronchiolitis and emphysema. The U.S. EPA's Office of Air Quality Planning and Standards, for a hazard ranking under Section 112(g) of the Clean Air Act Amendments, considers cadmium oxide to be a "high concern" pollutant based on severe acute toxicity (ARB, 1997b).

Human developmental studies are limited, although there is some evidence to suggest that maternal cadmium exposure may result in decreased birth weights. Cadmium oral exposure induces testicular necrosis in experimental animals, ovarian damage, infertility, placental toxicity and embryo and fetotoxicity and teratogenicity. Developmental effects such as decreased weight gain and neurobehavioral deficits have been reported in animal studies (ARB, 1997b). Cadmium was listed by the State of California under Proposition 65 as a male reproductive and developmental toxicant in May 1997 (OEHHA, 2005).

D. Chromium

Exposure to chromium and chromium compounds may result in both cancer and noncancer health effects. The probable routes of human exposure to chromium compounds are inhalation, ingestion, and dermal contact (OEHHA, 2000).

1. Cancer

There are a number of human occupational studies that have demonstrated that inhalation exposure to chromium results in an increased risk of lung cancer mortality in humans. An oral chromium carcinogenicity bioassay study also shows that there is a significantly increased incidence of stomach carcinomas in female mice and benign tumors (papillomas and hyperkeratomas) in both male and female mice (OEHHA, 2002).

The OEHHA staff has performed an extensive assessment of the potential health effects of chromium (hexavalent), reviewing available carcinogenicity data. OEHHA concluded that chromium and chromium compounds are potential human carcinogens with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified hexavalent chromium as a TAC in January 1986 (ARB, 1985). Chromium (hexavalent compounds) was listed by the State of California under Proposition 65 as carcinogens in February 1987 (OEHHA, 2005).

In 1990, the U.S. Congress listed chromium compounds as HAPs in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The U.S. EPA has classified chromium (VI) in Group A: Human carcinogen and chromium (III) in Group D: Not classifiable as to carcinogenicity in humans (U.S. EPA, 2005). The International Agency for Research on Cancer has classified chromium (VI) compounds in Group 1: Human carcinogen, and metallic chromium and chromium (III) in Group 3: Not classifiable (IARC, 2005).

2. Noncancer

The principal chronic effect of chromium (VI) exposure is that Cr(VI) forms oxyanions at physiological pH ($CrO4^{2}$), which are quite similar to sulfate ($SO4^{-2}$) and phosphate ($HPO4^{-3}$) anions. Therefore, it is able to penetrate virtually every cell in the body because all cells transport sulfate and phosphate. Harmful effects are speculated to be related to the reduction of Cr(VI) to Cr(III) intracellularly when it crosses the cell membrane and forms complexes with intracellular macromolecules. Thus, Cr(VI) compounds have the potential to injure numerous organ systems. Toxicity following chronic Cr(VI) exposure has been reported in the respiratory tract, gastrointestinal system, eyes and conjunctiva, kidney, and hematopoietic system. Cr(VI) is corrosive and exposure to chromic acid mists may cause chronic skin ulcerations and upper respiratory lesions. In addition, allergic skin and respiratory reactions can occur with no relation to dose (OEHHA, 2000).

Nasal tissue damage has been frequently observed in chromium plating workers exposed chronically to chromic acid mists. However, workers in the chromate extraction and ferrochromium industry, exposed to particulates containing soluble Cr(VI) compounds, have also reported nasal lesions. Nasal lesions include perforated septum, ulcerated septum, nasal atrophy, nosebleed, and inflamed mucosa (OEHHA, 2000).

E. Hydrochloric Acid

Exposure to hydrochloric acid (HCl) may result noncancer health effects. The probable routes of human exposure to hydrochloric acid are inhalation and dermal contact (ARB, 1997b).

1. Cancer

Hydrochloric acid is a federal HAP and was identified as a TAC in April 1993 under AB 2728. No information is available on the carcinogenic effects of hydrochloric acid in humans. In one study, no carcinogenic response was observed in rats exposed by inhalation. The U.S. EPA has not classified hydrochloric acid as to its human carcinogenicity (U.S. EPA, 2005). The International Agency for Research on Cancer has classified hydrochloric acid in Group 3: Not classifiable as to its potential human carcinogenicity (IARC, 2005).

2. Noncancer

Inhalation exposure to high concentrations of HCl fumes may result in coughing, a choking sensation, burning of the respiratory tract, and pulmonary edema. Dental erosion has been reported in workers chronically exposed to low levels of gaseous hydrogen chloride. Reactive Airway Dysfunction Syndrome (RADS; acute, irritant-induced asthma) was reported in three male police officers (36 to 45 years old) who responded to a roadside chemical spill. Other reports of RADS include individual occupational cases (OEHHA, 1999).

Persons with preexisting skin, eye, gastrointestinal tract (including ulcers) or respiratory conditions or underlying cardiopulmonary disease may be more sensitive to the effects of HCl exposure. Persons also exposed to formaldehyde might be at increased risk for developing cancer (OEHHA, 1999).

The reproductive hazard of hydrogen chloride to humans is unknown. Few studies on the reproductive effects of HCl exposure were found in the literature. Maternal exposure to a high concentration of a strong acid could result in metabolic acidosis and subsequent fetal acidemia which has been linked with low Apgar scores, neonatal death, and seizures. However, there is no evidence linking HCl exposure to fetal academia (OEHHA, 1999).

F. Lead (Inorganic)

Exposure to lead may result in cancer health effects. The probable routes of human exposure to lead are inhalation and ingestion (ARB, 1997b).

1. Cancer

There are several inconclusive epidemiological studies of exposed workers which provided limited evidence of cancers of the kidney, stomach, and respiratory tract. Rodent studies have found increased kidney cancers following the oral administration of lead (ARB, 1997b).

OEHHA staff has performed an extensive assessment of the potential health effects of lead and lead compounds, reviewing available carcinogenicity data. OEHHA concluded that lead and lead compounds (inorganic) are a potential human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified inorganic lead as a TAC in April 1997 (ARB, 1997a). Lead and lead compounds, lead acetate, lead phosphate, and lead subacetate were listed by the State of California under Proposition 65 as carcinogens in October 1992, January 1988, April 1988, and October 1989, respectively (OEHHA, 2005).

In 1990, the U.S. Congress listed lead compounds (including inorganic lead) as HAPs in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). U.S. EPA has classified lead in Group B2: Probable human carcinogen (U.S. EPA, 2005). The International Agency for Research on Cancer has classified lead and inorganic lead compounds in Group 2B: Possibly carcinogenic to humans, and organic lead in Group 3: Not classifiable (IARC, 2005).

2. Noncancer

Lead salts (e.g., lead acetate, lead subacetate) are considered to be forms of inorganic lead. Most significant non-workplace, outdoor air exposure to lead in California is expected to be to inorganic lead particulate. Although different lead species (e.g., lead oxide, lead sulfide, etc.) are absorbed to varying degrees following inhalation, all are capable of causing adverse health effects once they reach sensitive tissues (ARB, 1997b).

Lead is slowly excreted by the body. Exposures to small amounts of lead over a long time can slowly accumulate to reach harmful levels. Harmful effects may therefore develop gradually without warning. Short-term exposure to high levels of lead may also cause harm. Lead can adversely affect the nervous, reproductive, digestive, cardiovascular blood-forming systems, and the kidney. Symptoms of nervous system effects include fatigue and headaches. More serious symptoms include feeling anxious or irritable and difficulty sleeping or concentrating. Severe symptoms include loss of short-term memory, depression, and confusion. More severe exposures can prove

fatal. Lead can also injure the peripheral nerves to cause weakness in the extremities. Children are a sensitive population as they absorb lead more readily and the developing nervous system puts them at increased risk for lead-related harm, including learning disabilities. Effects on the gastrointestinal tract include nausea, constipation, and loss of appetite. Recovery from severe effects on the nervous system or kidneys is not always complete. Other ill effects include hypertension and anemia. The toxicological endpoints considered for chronic toxicity are the kidney, cardiovascular or blood system, immune, reproductive, and central or peripheral nervous systems (ARB, 1997b).

In men, adverse reproductive effects include reduced sperm count and abnormal sperm. In women, adverse reproductive effects include reduced fertility. Still-birth, miscarriage, low birth weight, and neurobehavioral deficits may be more likely (ARB, 1997b). Lead was listed by the State of California under Proposition 65 as developmental toxicant and a male and female reproductive toxicant in February 1987 (OEHHA, 2005).

G. Manganese

Exposure to manganese and compounds may result in noncancer health effects. The probable route of human exposure to manganese and compounds is by ingestion and inhalation (ARB, 1997b).

1. Cancer

No studies are available regarding the carcinogenic effects of manganese and manganese compounds in humans or animals (ARB, 1997b).

In 1990, the U.S. Congress listed manganese compounds as HAPs in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). Manganese compounds were identified as TACs by the Board in April 1993 under AB 2728 (ARB, 1993). The U.S. EPA has classified manganese in Group D: Not classifiable as to human carcinogenicity (U.S. EPA, 2005). The International Agency for Research on Cancer has not classified manganese as to its carcinogenicity (IARC, 2005).

2. Noncancer

Short-term exposure to manganese may cause irritation to the eyes, nose, throat, and respiratory tract. Long-term exposure to manganese may affect the central nervous system, causing a psychosis which may include symptoms similar to Parkinson's disease. Respiratory effects may also be seen (ARB, 1997b).

I. Mercury (Inorganic)

Exposure to mercury and mercury compounds may result in noncancer health effects. The probable routes of human exposure to mercury and mercury compounds are inhalation, ingestion, and dermal contact (ARB, 1997b).

1. Cancer

The human studies available regarding elemental mercury and cancer are inconclusive due to lack of valid exposure data and confounding factors. No studies are available on the carcinogenic effects of methyl mercury in humans. One available animal study reported renal tumors in mice. A chronic study on mercuric chloride in rats and mice reported an increased incidence of forestomach and thyroid tumors in rats, and an increased incidence of renal tumors in mice (ARB, 1997b).

In 1990, the U.S. Congress listed mercury compounds as HAPs in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The Board formally identified mercury as a TAC in April 1993 under AB 2728 (ARB, 1993). Methyl mercury compounds were listed by the State of California under Proposition 65 as carcinogens in May 1996 (OEHHA, 2005). The U.S. EPA has classified inorganic and methyl mercury in Group C: Possible human carcinogen; and elemental mercury in Group D: Not classifiable as a carcinogen (U.S. EPA, 2005). The International Agency for Research on Cancer has classified methyl mercury compounds in Group 2B: Possible human carcinogen, and metallic mercury and inorganic mercury compounds in Group 3: Not classifiable (IARC, 2005).

2. Noncancer

The respiratory tract is the first organ system affected in the case of acute inhalation poisonings. Acute exposure to mercury can lead to shortness of breath within 24 hours and a rapidly deteriorating course leading to death due to respiratory failure (OEHHA, 1999).

Central nervous system (CNS) effects such as tremors or increased excitability are sometimes seen in cases of acute accidental exposures. Long-term effects from a single exposure to mercury have been reported in six male workers exposed to an estimated concentration of 44 mg Hg/m^3 for a period of several hours. Long-term CNS effects included nervousness, irritability, lack of ambition, and loss of sexual drive for several years. Shortness of breath also persisted for years in all cases. Similar cases of CNS disturbances, including irritability, insomnia, malaise, anorexia, fatigue, ataxia, and headache have been reported in children exposed to vapor from spilled elemental mercury in their home (OEHHA, 1999).

Persons with preexisting allergies, skin conditions, chronic respiratory disease, nervous system disorders, or kidney diseases might have increased toxicity. Persons exposed to other neurotoxicants might have increased sensitivity. People who

consume significant amounts of fish from areas with advisories for daily fish intake due to mercury contamination may be more susceptible to the acute toxicity of airborne mercury (OEHHA, 1999).

The primary effects of chronic exposure to mercury vapor are on the central nervous system. Chronic duration exposures to elemental mercury have resulted in tremors (mild or severe), unsteady walking, irritability, poor concentration, short-term memory deficits, tremulous speech, blurred vision, performance decrements, paresthesia, and decreased nerve conduction. Motor system disturbance can be reversible upon cessation of exposure; however, memory deficits may be permanent. Studies have shown effects such as tremor and decreased cognitive skills in workers exposed to approximately 25 $\mu g/m^3$ mercury vapor (OEHHA, 2000).

The kidney is also a sensitive target organ of mercury toxicity. Effects such as proteinuria, proximal tubular and glomular changes, albuminuria, glomerulosclerosis, and increased urinary N-acetyl-β-glucosaminidase have been seen in workers exposed to approximately 25 to 60 $\mu g/m^3$ mercury vapor. Chronic exposure to mercury vapors has also resulted in cardiovascular effects such as increased heart and blood pressure and in leukocytosis and neutrophilia (OEHHA, 2000).

In rats, elemental mercury readily crosses the placental barrier and accumulates in the placenta following inhalation. One study reported decreased crown-rump length and increased incidence of edema in hamster fetuses following single subcutaneous administration of 4 mg/kg Hg as mercuric acetate on day 8 of gestation. Exposure to 2.5 mg/kg Hg resulted in no significant developmental defects in these hamsters. This study later showed that the most common manifestations of mercury-induced embryotoxicity in hamsters were resorption, edema, and cardiac abnormalities. Pregnant rats exposed by inhalation to 1.8 mg/m^3 of metallic mercury for 1 hour or 3 hours/day during gestation (days 11 through 14 plus days 17 through 20) bore pups that displayed significant dose-dependent deficits in behavioral measurements three to seven months after birth compared to unexposed controls. Behaviors measured included spontaneous motor activity, performance of a spatial learning task, and habituation to the automated test chamber. The pups also showed dose-dependent, increased mercury levels in their brains, livers, and kidneys two to three days after birth (OEHHA, 1999). Mercury and mercury compounds were listed by the State of California under Proposition 65 as developmental toxicants in July 1987 (OEHHA, 2005).

J. Nickel

Exposure to nickel and nickel compounds may result in both cancer and noncancer health effects. The probable route of human exposure to nickel is by ingestion, inhalation, and dermal (ARB, 1997b).

1. Cancer

Inhalation exposure to nickel refinery dust and nickel subsulfide has been shown to cause nasal and lung cancer in refinery workers. Nickel carbonyl has been reported to cause lung tumors in animal studies. OEHHA staff concluded that based on available genotoxicity and carcinogenicity data and physiochemical properties of nickel compounds, all nickel compounds should be considered potentially carcinogenic to humans by inhalation, and total nickel should be considered when evaluating the risk by inhalation (ARB, 1997b).

OEHHA staff has performed an extensive assessment of the potential health effects of nickel, reviewing available carcinogenicity data. OEHHA concluded that nickel and compounds are potential human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified nickel and nickel compounds as TACs in August 1991 (ARB, 1991). Nickel and certain nickel compounds (nickel acetate, nickel carbonate, nickel carbonyl, nickel refinery dust from the pyrometallurgical process, nickel subsulfide) were listed by the State of California under Proposition 65 as carcinogens in October 1987, October 1989, and May 2004 (OEHHA, 2005).

In 1990, the U.S. Congress listed nickel compounds as HAPs in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The U.S. EPA has classified nickel refinery dusts and nickel subsulfide in Group A: Human carcinogen and nickel carbonyl in Group B2: Probable human carcinogen (U.S. EPA, 2005).

The International Agency for Research on Cancer (IARC) reviewed nickel and nickel compounds in 1990 and concluded that there is sufficient evidence in humans for the carcinogenicity of nickel sulfate, and of the combinations of nickel sulfides and oxides encountered in the nickel refining industry; there is inadequate evidence in humans for the carcinogenicity of metallic nickel and nickel alloys; there is sufficient evidence in experimental animals for the carcinogenicity of metallic nickel, nickel monoxides, nickel hydroxides and crystalline nickel sulfides; there is limited evidence in experimental animals for the carcinogenicity of nickel alloys, nickelocene, nickel carbonyl, nickel salts, nickel arsenides, nickel antimonide, nickel selenides, and nickel telluride; and there is inadequate evidence in experimental animals for the carcinogenicity of nickel trioxide, amorphous nickel sulfide and nickel titanate. IARC concluded that nickel compounds are carcinogenic to humans, classifying them in Group 1: Human carcinogen; and classified metallic nickel in Group 2B: Possible human carcinogen (ARB, 1997b).

The International Committee on Nickel Carcinogenesis in Man indicated that the epidemiological evidence points to insoluble and soluble nickel compounds as contributing to the cancers seen in occupationally exposed persons. Both insoluble and soluble nickel compounds have produced tumors in animals by a variety of routes, primarily by injection. Both soluble and insoluble nickel compounds are genotoxic in a wide variety of assays. Evidence is available indicating that the Ni^{2+} ion is probably the carcinogenic agent (ARB, 1997b). IARC has classified inorganic arsenic and arsenic compounds as Group 1: Human carcinogen based on sufficient evidence in humans (IARC, 2005).

2. Noncancer

Soluble nickel compounds appear to be the greatest concern for acute health effects. The soluble forms of nickel are absorbed as Ni^{2+}. Divalent nickel competes with copper for binding to serum albumin and is systemically transported in this way. The kidneys, lungs, and placenta are the principal organs for systemic accumulation of nickel. In contrast to the long half-life of the insoluble forms of nickel in the nasal mucosa, the elimination half-life of Ni^{2+} in the plasma is one to two days in mice (OEHHA, 1999).

The effects from long-term exposure to nickel include respiratory tract irritation and immune alterations such as dermatitis ("nickel itch") and asthma. Acute exposure to nickel and nickel compound fumes may cause irritation of the respiratory tract, skin, and eyes. A daily requirement of 50 micrograms of nickel has been estimated to be an essential element in human nutrition. Nickel carbonyl is the most acutely toxic form of nickel. Exposure to nickel carbonyl can cause irritation of the lower respiratory tract and delayed pulmonary edema. It may also injure the liver and central nervous system (ARB, 1997b).

Although there are insufficient data to assess nickel's effect on reproductive functions in humans, all forms of nickel examined to date in laboratory animals have exhibited adverse effects on male reproductive function. Animal studies also demonstrate that nickel adversely affects spermatogenesis, litter size and pup body weight; however, no teratogenic effects have been clearly demonstrated for compounds other than nickel carbonyl (ARB, 1997b). Nickel carbonyl was listed by the State of California under Proposition 65 as developmental toxicants in September 1996 (OEHHA, 2005).

K. Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans

There are 210 polychlorinated dibenzo-*p*-dioxin (PCDD) and dibenzofuran (PCDF) isomers. The various isomers are not equally toxic nor are they considered equally potent as carcinogens or non-carcinogens. For the purpose of assessing cancer and noncancer risk associated with these chemicals, OEHHA has adopted the World Health Organization 1997 (WHO_{-97}) Toxicity Equivalency Factor scheme for evaluating the cancer and noncancer risk due to exposure to samples containing mixtures of PCDD and PCDF (OEHHA, 2003). In cases where speciation of PCDDs and PCDFs has not been performed, then 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) serves as the surrogate for PCDD and PCDF emissions (OEHHA, 2003).

Exposure to PCDDs and PCDFs may result in both cancer and noncancer health effects. The probable route of human exposure to TCDD is by ingestion, inhalation, and dermal exposure through contact with contaminated soils (ARB, 1997b).

1. Cancer

Mother's milk may expose a nursing baby to 4 to 12 percent of the estimated lifetime dose. Once dioxin enters the human body, a small amount is metabolized and eliminated, while the rest bioaccumulates in body fat. As fat is metabolized, stored dioxin is released and excreted primarily in feces. The body's concentration is dependent on the rates of ingestion, elimination, and storage capacity of dioxin. The approximate half-life of dioxin in humans was estimated to range from six to ten years (ARB, 1997b).

Human studies which have reported cancer increases are inconclusive because of inadequate data. There is adequate evidence to support a conclusion that TCDD is carcinogenic in rodents and should be considered a potential carcinogen to humans. Ingestion studies in rodents have shown increases in tumors of the liver, lung, squamous cell, nasal turbinates, and hard palate (ARB, 1986a).

OEHHA staff has performed an extensive assessment of the potential health effects of PCDDs and PCDFs, reviewing available carcinogenicity data. OEHHA concluded that PCDDs and PCDFs are potential human carcinogens with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified PCDDs and PCDFs as TACs in July 1986 (ARB, 1986a). PCDDs and PCDFs were listed by the State of California under Proposition 65 as carcinogens in October 1992 (OEHHA, 2005).

In 1990, the U.S. Congress listed TCDD as a HAP in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). U.S. EPA has classified hexachlorodibenzo-*p*-dioxin (HxCDD), mixture of 1,2,3,6,7,8-HxCDD and 1,2,3,7,8,9-HxCDD as B2; probable human carcinogen (U.S. EPA, 2005). The International Agency for Research on Cancer has classified TCDD as Group 1: Human carcinogen, based on sufficient evidence in humans (IARC, 2005).

2. Noncancer

Acute exposure of humans to dioxins has caused chloracne, liver toxicity, skin rashes, nausea, vomiting, and muscular aches and pains. A severe weight loss in animals has been observed following acute exposure to dioxin as have hyperkeratosis, facial alopecia, inflammation of the eyelids, and loss of fingernails and eyelashes. The immune system appears to be very sensitive to dioxin toxicity. Thymic atrophy is a prominent finding in exposed animals and has been observed in all laboratory species examined. Other lymphoid tissues such as the spleen, lymph nodes, and bone marrow are also affected. Symptoms of chronic exposure to dioxins include splenic and testicular atrophy, elevated gamma-glutamyl transpeptidase levels, elevated cholesterol levels, and abnormal neurological findings. Other effects may include risk of enzyme induction, diabetes, and endocrine changes (ARB, 1997b).

Potential effects of a toxicant on normal fetal development include fetal death, growth retardation, structural malformations and organ system dysfunction. Evidence for all four of these responses has been seen in human populations exposed to dioxin-like compounds. In these poisoning episodes populations were exposed to a complex mixture of halogenated aromatic hydrocarbons contained within PCBs, PCDFs and PCDDs mixtures thus limiting the conclusions that could be drawn from the data (OEHHA, 2000). Animal studies have shown TCDD to be both teratogenic and fetotoxic. Reproductive and teratogenic effects observed in animals are cleft palate, kidney abnormalities, decreased fetal weight and survival, hydrocephalus, open eye, edema, resorptions, petechiae, and infertility (ARB, 1997b). TCDD was listed by the State of California under Proposition 65 as developmental toxicants in January 1988 (OEHHA, 2005).

L. Polycyclic Aromatic Hydrocarbons (PAHs)

Polycyclic organic matter (POM) consists of over 100 compounds and is defined by the Federal Clean Air Act as organic compounds with more than one benzene ring that have a boiling point greater than or equal to 100°C. POM can be divided into the subgroups of polycyclic aromatic hydrocarbons (PAHs) and PAH-derivatives. PAHs are organic compounds which include only carbon and hydrogen with a fused ring structure containing at least two benzene (six-sided) rings. PAHs may also contain additional fused rings that are not six-sided. PAH-derivatives also have at least two benzene rings and may contain additional fused rings that are not six-sided rings. However, PAH-derivatives contain other elements in addition to carbon and hydrogen (ARB, 1997b).

Health values and potency equivalency factors (PEFs) have been developed for approximately 26 PAHs. When speciation of PAHs has been performed on facility emissions, these health values and PEFs should be used. In those cases where speciation of PAHs has not been performed, then benzo(a)pyrene [B(a)P] serves as the surrogate carcinogen for all PAH emissions (OEHHA, 2003).

Exposure to PAHs may result in both cancer and noncancer health effects. The probable route of human exposure to PAHs is by ingestion, inhalation, and dermal contact (ARB, 1997b).

1. Cancer

Available epidemiological information is from persons exposed to mixtures such as tobacco smoke, diesel exhaust, air pollutants, synthetic fuels, or other similar materials. Several IARC publications have been dedicated to the analysis of cancer in processes which involve exposure to polynuclear aromatic compounds (PAHs). The types of cancer reported are often consistent with the exposure pathway: scrotal cancer and lung cancer in chimney sweeps exposed to soot; skin cancer (including scrotal cancer) where shale oils are used; and lung cancer where airborne exposure of PAHs occurs, such as in iron and steel foundries. In animal studies, B(a)P is carcinogenic by intratracheal, inhalation, dermal exposure, intraperitoneal injection, and when given in the diet (OEHHA, 2002).

OEHHA staff has performed an extensive assessment of the potential health effects of PAHs, reviewing available carcinogenicity data. OEHHA concluded that PAHs are potential human carcinogens with no identifiable threshold below which no carcinogenic effects are likely to occur. POM is a federal HAP and was identified as a TAC in April 1993 under AB 2728. The Board formally identified B(a)P as a TAC in April 1994 (ARB, 1994). Several POM compounds (including benzo(a)pyrene) were listed by the State of California under Proposition 65 as carcinogens in July 1987 (OEHHA, 2005).

In 1990, the U.S. Congress listed POM as a HAP in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). U.S. EPA has classified benzo[a]pyrene in Group B2: Probable human carcinogen, based on sufficient evidence of carcinogenicity in animals (U.S. EPA, 2005). The International Agency for Research on Cancer has classified benzo[a]pyrene in Group 2A: Probable human carcinogen based on sufficient evidence in animals and limited evidence in humans (IARC, 2005).

2. Noncancer

No information is available on the acute effects of POM in humans. Enzyme alterations in the mucosa of the gastrointestinal tract and increased liver weights have been reported in animals exposed orally to several PAHs. Chronic exposure to benzo(a)pyrene in humans has resulted in dermatitis, photosensitization in sunlight, eye irritation and cataracts. Animal studies have reported effects on the blood and liver from oral exposure to benzo(a)pyrene and effects on the immune system from dermal exposure to benzo(a)pyrene (ARB, 1997b).

No information is available on adverse reproductive or developmental effects of POM in humans. Oral exposure to benzo(a)pyrene in animals has been reported to result in adverse reproductive effects, including reduced incidence of pregnancy and

decreased fertility; and developmental effects such as reduced viability of litters and reduced mean pup weight, and decreased fertility in offspring. Benzo(a)pyrene has been demonstrated to cause transplacental carcinogenesis in animals (ARB, 1997b).

REFERENCES FOR APPENDIX F

ARB, 1985. Public Hearing to Consider the Adoption of a Regulatory Amendment Identifying Hexavalent Chromium as a Toxic Air Contaminant. California Air Resources Board. December 1985.

ARB, 1986a. Public Hearing to Consider the Adoption of a Regulatory Amendment Identifying Chlorinated Dioxins and Dibenzofurans as Toxic Air Contaminants. California Air Resources Board. June 1986.

ARB, 1986b. Public Hearing to Consider the Adoption of a Regulatory Amendment Identifying Cadmium as a Toxic Air Contaminant. Technical Support Document. California Air Resources Board. December 1986.

ARB, 1990. Proposed Identification of Inorganic Arsenic as a Toxic Air Contaminant. Technical Support Document. Part A. California Air Resources Board. May 1990.

ARB, 1991. Proposed Identification of Nickel as a Toxic Air Contaminant. Technical Support Document. Final Report. California Air Resources Board. June 1991.

ARB, 1993. The Identification of Federal Hazardous Air Pollutants as Toxic Air Contaminants. Technical Support Document. Final Report. California Air Resources Board. June 1993.

ARB, 1994. Benzo[a]pyrene as a Toxic Air Contaminant. Technical Support Document. California Air Resources Board. July 1994.

ARB, 1997a. Proposed Identification of Inorganic Lead as a Toxic Air Contaminant. California Air Resources Board. March 1997.

ARB, 1997b. Toxic Air Contaminant Identification List - Summaries, California Air Resources Board, September 1997.

IARC, 2005. International Agency for Research on Cancer (IARC). Overall Evaluations of Carcinogenicity to Humans. World Health Organization. Lyon, France. Printed on August 24, 2005, from IARC website *www-cie.iarc.fr/monoeval/crthall.html* . (Since printing, web address has changed to *http://monographs.iarc.fr/ENG/Classification/crthall.php* .)

OEHHA, 1999. The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part I; The Determination of Acute Reference Exposure Levels for Airborne Toxicants, Office of Environmental Health Hazard Assessment. March 1999.

OEHHA, 2000. The Air Toxics Hot Spots Program Risk Assessment Guidelines; Part III; Technical Support Document for the Determination of Noncancer Chronic Reference Exposure Levels, Office of Environmental Health Hazard Assessment. Office of Environmental Health Hazard Assessment. April 2000.

OEHHA, 2002. Part II, Technical Support Document for Describing Available Cancer Potency Factors (Revised). Office of Environmental Health Hazard Assessment. December 2002.

OEHHA, 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August 2003.

OEHHA, 2005. Chemicals Known To The State To Cause Cancer Or Reproductive Toxicity, August 19, 2005. Office of Environmental Health Hazard Assessment. Printed on August 24, 2005, from OEHHA website *www.oehha.ca.gov/prop65/prop65_list/Newlist.html* .

U.S. EPA, 2005. Integrated Risk Information System (IRIS). United States Environmental Protection Agency (U.S. EPA). Website address: *www.epa.gov/iris/index.html* .

Appendix G

Glossary of Definitions, Selected Terms, and Acronyms

Appendix G

Glossary of Definitions, Selected Terms, and Acronyms

Definitions

Acute Exposure: One or a series of short-term exposures generally lasting less than 24 hours.

Acute Health Effects: A health effect that occurs over a relatively short period of time (e.g., minutes or hours). The term is used to describe brief exposures and effects which appear promptly after exposure.

Adverse Health Effect: A health effect from exposure to air contaminants that may range from relatively mild temporary conditions, such as eye or throat irritation, shortness of breath, or headaches, to permanent and serious conditions, such as birth defects, cancer or damage to lungs, nerves, liver, heart, or other organs.

Air District or District: The Air Pollution Control and Air Quality Management Districts, as defined in Health and Safety Code section 39025, are the political bodies responsible for managing air quality on a regional or county basis. California is currently divided into 35 air districts.

Airborne Toxic Control Measure: Section 39655 of the Health and Safety Code, defines an "Airborne Toxic Control Measure" means either of the following:

1) Recommended methods, and, where appropriate, a range of methods, that reduce, avoid, or eliminate the emissions of a toxic air contaminant. Airborne toxic control measures include, but are not limited to, emission limitations, control technologies, the use of operational and maintenance conditions, closed system engineering, design equipment, or work practice standards, and the reduction, avoidance, or elimination of emissions through process changes, substitution of materials, or other modifications.
2) Emission standards adopted by the U.S. Environmental Protection Agency pursuant to section 112 of the federal act (42 U.S.C. Sec. 7412).

Asthma: A chronic inflammatory disorder of the lungs characterized by wheezing, breathlessness, chest tightness, and cough.

Bioaccumulation: The concentration of a substance in a body or part of a body or other living tissue in a concentration higher than that of the surrounding environment.

California Air Resources Board (ARB): The State's lead air quality management agency consisting of an eleven-member board appointed by the

Governor. The ARB is responsible for attainment and maintenance of the state and federal air quality standards, and is fully responsible for motor vehicle pollution control. It oversees county and regional air pollution management programs.

California Air Pollution Control Officers Association (CAPCOA): A non-profit association of the air pollution control officers from all 35 air quality districts throughout California. CAPCOA was formed in 1975 to promote clean air and to provide a forum for sharing knowledge, experience, and information among the air quality regulatory agencies around the state.

CCR: California Code of Regulations

Chronic Exposure: Long-term exposure, usually lasting one year to a lifetime.

Chronic Health Effect: An adverse non-cancer health effect that develops and persists (e.g., months or years) over time after long-term exposure to a substance.

Cruise Ship: A commercial vessel that has the capacity to carry 250 or more passengers for hire and has berths or overnight accommodations for passengers.

Developmental Toxicity: Adverse effects on the developing organism that may result from exposure prior to conception (either parent), during prenatal development, or postnatally to the time of sexual maturation. Adverse developmental effects may be detected at any point in the life span of the organism. Major manifestations of developmental toxicity include: death of the developing organism; induction of structural birth defects; altered growth; and functional deficiency.

Dose: A calculated amount of a substance estimated to be received by the subject, whether human or animal, as a result of exposure. Doses are generally expressed in terms of amount of chemical per unit body weight; typical units are mg/kg-day.

Dose-response Assessment: The process of characterizing the relationship between the exposure to an agent and the incidence of an adverse health effect in exposed populations.

Endpoint: An observable or measurable biological or biochemical event including cancer used as an index of the effect of a chemical on a cell, tissue, organ, organism, etc.

Epidemiology: The study of the occurrence and distribution of a disease or physiological condition in human populations and of the factors that influence this distribution.

Exposure: Contact of an organism with a chemical, physical, or biological agent. Exposure is quantified as the amount of the agent available at the exchange boundaries of the organism (e.g., skin, lungs, digestive tract) and available for absorption.

Exposure Pathway: A route of exposure by which xenobiotics enter the human body (e.g., inhalation, ingestion, dermal absorption).

HSC: Health and Safety Code of the State of California.

Hazardous Air Pollutant (HAP): A substance that the U.S. Environmental Protection Agency has listed in, or pursuant to, section 112 subsection (b) of the federal Clean Air Act Amendments of 1990 (42 U.S. Code, section 7412(b)).

Health Risk Assessment: A health risk assessment (HRA) is an evaluation or report that a risk assessor (e.g., Air Resources Board, district, consultant, or facility operator) develops to describe the potential a person or population may have of developing adverse health effects from exposure to a facility's emissions. Some health effects that are evaluated could include cancer, developmental effects, or respiratory illness. The pathways that can be included in an HRA depend on the toxic air pollutants that a person (receptor) may be exposed to, and can include inhalation (breathing), the ingestion of soil, water, crops, fish, meat, milk, and eggs, and dermal exposure.

Hazard Index (HI): The sum of individual acute or chronic hazard quotients (HQs) for each substance affecting a particular toxicological endpoint.

Incinerator: Any device used to conduct onboard incineration.

International Maritime Organization (IMO): A specialized agency of the United Nations which is responsible for measures to improve the safety and security of international shipping and to prevent marine pollution from ships. The IMO, along with other maritime nations, has developed standards which are set forth in the International Convention for the Prevention of Pollution from Ships (MARPOL).

MARPOL: A combination of two treaties adopted in 1973 and 1978 that has been updated by amendments over the years. MARPOL includes six technical annexes which include regulations aimed at preventing and minimizing pollution from ships.

Multipathway Substance: A substance or chemical that once airborne from an emission source can, under environmental conditions, be taken into a human receptor by inhalation and by other exposure routes such as after deposition on skin or after ingestion of soil contaminated by the emission.

Noncarcinogenic Effects: Noncancer health effects which may include birth defects, organ damage, morbidity, and death.

Oceangoing Ship: A private, commercial, government, or military vessel of 300 gross registered tons or more calling on California ports or places.

Office of Environmental Health Hazard Assessment (OEHHA): An office within the California Environmental Protection Agency that is responsible for evaluating chemicals for adverse health impacts and establishing safe exposure levels. OEHHA also assists in performing health risk assessments and developing risk assessment procedures for air quality management purposes.

Onboard Incineration: The combustion or burning of any materials or wastes for the purpose of volume reduction, destruction, sanitation, or sterilization, aboard a cruise ship. Onboard incineration does not include incinerators which are only burning gas oil, marine gas oil, marine diesel fuel, fuel oil, or residual fuel oil for the specific purpose of maintaining a minimum temperature in the incinerator to minimize thermal cycling.

Potency: The relative effectiveness, or risk, of a standard amount of a substance to cause a toxic response.

Proposition 65: The Safe Drinking Water and Toxic Enforcement Act of 1986, also known as Proposition 65. This Act is codified in California Health and Safety Code Section 25249.5, et seq. No person in the course of doing business shall knowingly discharge or release a chemical known to the state to cause cancer or reproductive toxicity into water or into land where such chemical passes or probably will pass into any source of drinking water, without first giving clear and reasonable warning to such individual.

Reference Exposure Level (REL): An exposure level at or below which no noncancer adverse health effect is anticipated to occur in a human population exposed for a specific duration. An REL is virtually the same as the terms Reference Concentration (RfC) for inhalation or Reference Dose (RFD) used by U.S. EPA, only it may be for varying amounts of time rather than lifetime only. It has been given a different name so that the values estimated by the State Office of Environmental Health Hazard Assessment can easily be distinguished from those developed by the U.S. EPA. RELs are used to evaluate toxicity endpoints other than cancer.

Reproductive Toxicity: Harmful effects on fertility, gestation, or offspring, caused by exposure of either parent to a substance.

Risk: The (characterization of the) probability of potentially adverse effects to human health, in this instance from the exposure to environmental hazards.

Risk Assessment: The characterization (in the present context) of the probability of potentially adverse health effects to people from exposure to environmental chemical hazards.

Threshold, Nonthreshold: A threshold dose is the minimally effective dose of any chemical that is observed to produce a response (e.g., enzyme change, liver toxicity, death). For most toxic effects, except carcinogenesis, there appear to be threshold doses. Nonthreshold substances are those substances, including

nearly all carcinogens, that are known or assumed to have some risk of response at any dose above zero.

Toxic Air Contaminant (TAC): An air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health (HSC Section 39655(a)). Substances, which have been identified by the United States Environmental Protection Agency as hazardous air pollutants are also identified by the Board as toxic air contaminants.

United States Environmental Protection Agency (U.S. EPA): The Federal agency charged with setting policy and guidelines, carrying out legal mandates, for the protection, and national interests in environmental resources.

Variability: The ability to have different numerical values of a parameter, such as height or weight.

Acronyms

AB	Assembly Bill
ARB	Air Resources Board
Annex V	Regulation 9 of Annex V of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
Annex VI	Protocol of 1997, Annex VI – Regulations for the Prevention of Air Pollution from Ships
APHIS	U.S. Department of Agriculture, Animal and Plant Health Inspection Service
ATCM	Airborne Toxic Control Measure
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CSLC	California State Lands Commission
HAP	Hazardous Air Pollutant
HSC	Health and Safety Code
IARC	International Agency for Research on Cancer
IMO	International Maritime Organization
OEHHA	Office of Environmental Health Hazard Assessment
MARPOL	International Convention for the Prevention of Pollution from Ships
NOAA	National Oceanic and Atmospheric Administration
PAHs	Polycyclic Aromatic Hydrocarbons
PCDD	Polychlorinated Dibenzodioxin (dioxin)
PCDF	Polychlorinated Dibenzofuran (furan)
PM	Particulate Matter
SB	Senate Bill
SRP	Scientific Review Panel on Toxic Air Contaminants
Survey	Oceangoing Ship Onboard Incinerator Survey
TAC	Toxic Air Contaminant
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE STATIONARY DIESEL ENGINE CONTROL MEASURE

The Air Resources Board (Board or ARB) will conduct a public hearing at the time and place noted below to consider adoption of amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (Stationary Diesel Engine ATCM). The primary purpose of the proposed amendments is to establish regulatory requirements for in-use stationary diesel engines used in agriculture (agricultural engines). Other amendments are being proposed to clarify and streamline implementation of the Stationary Diesel Engine ATCM.

DATE: November 16, 2006

TIME: 9:00 a.m.

PLACE: Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., November 16, 2006, and may continue at 8:30 a.m., November 17, 2006. This item may not be considered until November 17, 2006. Please consult the agenda for the meeting, which will be available at least 10 days before November 16, 2006, to determine the day on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at (916) 323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at (916) 323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed adoption of title 17, California Code of Regulations (CCR), section 93115.1 through 93115.15 inclusive to supersede the requirements set forth in title 17, CCR, section 93115, as amended September 9, 2005, and amending existing title 17, CCR, section 93115.

Background: The California Toxic Air Contaminant Identification and Control Program, established under California law by Assembly Bill 1807 (Stats. 1983, Ch. 1047) and set forth in Health and Safety Code sections 39560-39675, requires ARB to identify and control toxic air contaminants (TAC) in California. The Board identified particulate

matter from diesel-fueled engines (diesel PM) as a TAC in August 1998. In October 2000, ARB staff published the diesel PM control needs assessment, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel Risk Reduction Plan). In the Diesel Risk Reduction Plan, ARB staff recommended control measures to reduce diesel PM from a variety of diesel-fueled vehicles and engines, including in-use agricultural engines.

In October 2001, the Office of Environmental Health Hazard Assessment (OEHHA) identified diesel PM among the top priority pollutants affecting children's health in accordance with The Children's Environmental Health Protection Act (Stats. 1999, Ch. 731).

Stationary Diesel Engine ATCM for Stationary Compression Ignition Engines

At a public hearing on February 26, 2004, the Board approved the Stationary Diesel Engine ATCM in order to reduce diesel PM emissions from new and in-use stationary diesel engines. Among other provisions, the Stationary Diesel Engine ATCM established emission standards for new agricultural engines, but specifically exempted in-use agricultural engines. In-use agricultural engines were exempted because the State Legislature was considering Senate Bill 700 (Stats. 2003, Ch. 479) to determine the regulatory/permitting status of agricultural emission sources, such as engines. Senate Bill 700 was subsequently enacted into law and removed the long-standing permit exemption for agricultural equipment. Additionally, the bill set forth local air district requirements and guidance for regulating agricultural emission sources. At public hearings in March 2005 and May 2005, the Board approved amendments to the regulation that established interim and final standards for new stationary agricultural engines.

In-Use Agricultural Engines Investigation

During the public hearing on February 26, 2004, the Board directed ARB staff to investigate the opportunities and challenges associated with replacing in-use agricultural engines with electric motors in order to reduce diesel PM emissions.

In March 2004, ARB staff began investigating and discussing electrification and other in-use agricultural engine regulatory measures with representatives from the agricultural industry, agricultural equipment suppliers, engine manufacturers, engine distributors/dealers, electric utilities, fuel suppliers, local air districts, environmental and community groups, and others.

From an air quality perspective, electrification of stationary diesel agricultural engines would be highly desirable because it virtually eliminates all emissions. There are now two utility incentive programs in operation to assist with electrification: Pacific Gas and Electric's Agricultural Internal Combustion Engine or AG-ICE Conversion Incentive Program and Southern California Edison's Time-of-Use Pumping Agricultural Internal Combustion Engine or TOU-PA-ICE Program. These programs provide reduced

electricity rates and electrical line and service extension allowances for growers who voluntarily replace stationary diesel agricultural irrigation pump engines with electric motors. Despite these incentive programs, cost continues to be a significant obstacle to electrification for many farmers. Staff also found that farmers' selection of irrigation pump equipment and preferred power source is a site-specific, case-by-case decision that depends on many variables including irrigation method and schedule, availability of surface water, well pumping depth, quantity of water needed, fuel costs, electricity costs, and electrical infrastructure proximity and adequacy. As a result, additional controls are necessary for those engines that cannot be replaced with electric motors.

In June 2005, the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and the South Coast Air Quality Management District (SCAQMD) Boards approved revisions to local rules that included oxides of nitrogen (NOx) emission standards for in-use agricultural engines. Although SJVUAPCD Rule 4702 and SCAQMD Rule 1110.2 do not specifically regulate diesel PM, they are expected to result in the replacement of older in-use agricultural engines with electric motors or new, cleaner diesel or other engines.

As part of this rulemaking, ARB staff updated the emission inventory for stationary diesel agricultural pump engines. ARB staff estimates there are about 8,600 agricultural engines operating in California in 2005. These engines account for about 1.6 tons per day (tpd) of diesel PM and 33 tpd day of oxides of nitrogen (NOx). The updated inventory and regulatory proposals were discussed during two public consultation meetings and four public workshops held in Colusa, Durham, Modesto, and Sacramento.

Description of the Proposed Regulatory Action:

Regulation of In-Use Agricultural Engines

ARB staff anticipates that most of the in-use agricultural engines affected by the proposed amendments will be those used to pump water for the irrigation of crops. The proposed amendments do not apply to diesel-fueled agricultural wind machine engines. Also, in-use agricultural emergency standby generator set engines and remotely-located agricultural engines are exempt from in-use emission limits provided they are registered with the local air district and comply with certain other provisions in the regulation.

Engine replacement is expected to be the most practical and cost-effective means of complying with the proposed amendments to the Stationary Diesel Engine ATCM. This strategy is expected to result in NOx, carbon monoxide (CO), and hydrocarbon (HC) emission reductions commensurate with diesel PM emission reductions. The compliance dates in the proposed Stationary Diesel Engine ATCM should not interfere with the implementation of the SJVUAPCD and SCAQMD rules regulating in-use agricultural engines.

The proposed amendments, in conjunction with local air district regulations, engine replacement incentive programs, and a negative growth factor for California's

agricultural industry, would benefit public health by reducing diesel PM exposure and cancer risk, particularly in areas where stationary diesel agricultural engines operate. The proposed amendments are also expected to result in reductions in emissions of other air pollutants, such as NOx and reactive organic gases (ROG). NOx and ROG are precursors to ozone formation in the lower atmosphere and NOx is a precursor to secondary PM. Table 1 summarizes projected PM and NOx emission reductions.

Table 1. Projected Diesel PM and NOx Emissions Reductions[1,2,3]

Year	Diesel PM Emission Reductions from 2005 TPD (TPY)	NOx Emission Reductions from 2005 TPD (TPY)
2012	0.9 (330)	16 (5,800)
2022	1.2 (440)	22 (8,100)

1. For in-use >50 hp stationary diesel agricultural pump engines.
2. All values have been rounded.
3. Emission reductions are based on year 2005 emission levels which were forecast based on a 2003 emission inventory.

Air pollution from diesel engines contributes to premature death, heart disease, respiratory illnesses like asthma and bronchitis, and increased risk of cancer. Decreased ozone formation is likely to reduce illness, emergency room visits, and hospital admissions due to respiratory problems. The proposed amendments would contribute to further progress in meeting ambient air quality standards for PM10, PM 2.5, and ozone. Additionally, the proposed amendments would benefit the environment by improving visibility and by reducing soiling, crop loss, and damage to ornamental and forest vegetation. ARB staff believes that the proposed amendments will effectively reduce diesel PM and other air pollutant emissions from in-use stationary diesel agricultural engines.

ARB staff has proposed renumbering title 17, CCR, section 93115 by creating multiple sections based on topic (e.g., section 93115.8 contains the specific requirements for new and in-use agricultural engines). ARB staff believes that the renumbering will facilitate the determination of applicability of the requirements of the ATCM.

Emission Limits

The proposed amendments to the ATCM use the off-road engine certification standards to determine which engines need to be replaced/upgraded, by when, and what emission limit must be met. The off-road engine certification standards are phased in as Tiers 1 through 4. The standards become more stringent as each tiered standard takes effect in four to five year increments. Pre-1996 engines are generally referred to as noncertified (Tier 0) engines because they were manufactured before the ARB/United States Environmental Protection Agency (U.S. EPA) off-road certification standards were effective.

The emission performance standards in the proposed amendments require greater than 50 hp in-use agricultural engines to meet Tier 3 or Tier 4 off-road compression ignition (CI) engine certification standards (title 13, CCR, section 2423) beginning December 31, 2010. With two exceptions, noncertified (pre-1996, uncontrolled or Tier 0) engines would be required not to exceed Tier 3 or Tier 4 standards in the 2011-2012 timeframe (see Table 2). Less than 175 horsepower (hp) Tier 0 non-emergency generator set engines would be required not to exceed Tier 4 standards in the 2016 timeframe. Greater than 750 hp Tier 0 engines would be required not to exceed Tier 4 standards in the 2015 timeframe.

All Tier 1- and Tier 2-certified engines would be required not to exceed Tier 4 standards in the 2015-2016 timeframe or 12 years after the date of initial installation, whichever is later (see Table 3). The purpose of the 12-year provision is to allow the owner/operators of Tier 1- and Tier 2-certified in-use agricultural engines at least 12 years of useful life.

Table 2. Proposed In-Use Stationary Diesel Agricultural Engine PM Emission Limits (Tier 0)

Noncertified (Tier 0) Engine Horsepower	Off-Road CI Engine Certification Standard	Proposed Stationary Diesel Engine ATCM Compliance Date
> 50 to 99	Tier 3 or Interim Tier 4	December 31, 2011
100-174	Tier 3	December 31, 2010
175-750	Tier 3	December 31, 2010
> 750	Tier 4	December 31, 2014

Table 3. Proposed In-Use Stationary Diesel Agricultural Engine PM Emission Limits (Tiers 1 and 2)

Tier 1 or Tier 2 Certified Engine Horsepower	Off-Road CI Engine Certification Standard	Proposed Stationary Diesel Engine ATCM Compliance Date
> 50 to 174	Tier 4	December 31, 2015[1]
≥ 175	Tier 4	December 31, 2014[1]

1. Or 12 years after initial installation

Compliance Dates

The compliance dates in the proposed amendments have been designed to take effect four years after Tier 3 and Tier 4 Off-Road CI Engine Certification Standards for new engines become effective. This compliance schedule allows one year to ensure the availability of compliant engine packages for agricultural applications and the potential for three years of operation prior to a compliance deadline. Providing up to three years of operation before the final compliance deadline would ensure that Carl Moyer Program funding could be used to provide incentives for earlier and more significant emissions reductions. Additionally, to ensure that compliant new engine packages for

agricultural applications are available, ARB staff is proposing to allow the ARB Executive Officer to extend an in-use stationary diesel agricultural emission standard compliance date for up to one year.

Residual Risk Provision

Depending on proximity to receptors, it is possible that some owner/operators who replace their Tier 0 engines with Tier 3 engines in accordance with the proposed amendments may still pose a risk to nearby receptors. Pursuant to the goals of the AB 2588 "Hot Spots" Program (title 17, CCR, section 93300.5) to address such risk issues, the proposed amendments to the ATCM contain a provision allowing local air districts, on a site-specific basis, to extend compliance dates with ATCM emission standards provided the engine meets Tier 4 engine Off-Road CI Engine Certification Standards for PM (i.e., 0.02 grams per brake horsepower hour (g/bhp-hr) for an engine greater than 50 bhp but less than 75 bhp or 0.01 g/bhp-hr for an engine greater than or equal to 75 bhp) no later than three years after the otherwise applicable ATCM compliance date. Staff does not anticipate any significant residual risk issues from engines with such low PM emission rates.

Engine Registration Program

With the exception of agricultural wind machines, the proposed amendments require new and in-use stationary diesel agricultural engine owners or operators to register each engine with the local air district. As part of the registration, owners or operators are required to pay any fees assessed by the districts to implement and enforce the ATCM and manage the registration program. To assist the local air districts, ARB staff plans to publish guidelines for the registration program, including suggested requirements for the submittal of contact, engine, and engine location information. Since most agricultural engines are not permitted, the registration program will provide a means for affected party notification and compliance assurance. The Executive Officer may approve alternative district programs that are equivalent.

Fuel Usage

The proposed amendments require owners and operators to fuel their in-use stationary diesel agricultural engines with CARB diesel or another Stationary Diesel Engine ATCM-compliant fuel. ARB staff does not foresee any difficulty in meeting this fuel requirement because CARB diesel fuel (and CARB diesel fuel-biodiesel blends) are the only diesel fuels that can be marketed in California as of July 2006.

Recordkeeping and Reporting

Owners and operators of in-use stationary diesel agricultural engines will be subject to recordkeeping and reporting requirements similar to the existing ATCM requirements for other stationary diesel engines. These requirements include maintaining records of annual hours of operation, where applicable.

Other Proposed Amendments

Staff is proposing several other changes to the Stationary Diesel Engine ATCM to address implementation and compliance issues. These include streamlining certain fuel reporting requirements, updating electricity tariff schedules, changing the definitions of California (CARB) diesel fuel and alternative diesel, adding a new compliance option to meet the 0.01 g/bhp-hr diesel PM standard, providing engine "sell-through" provisions, clarifying the definition of "emergency use" for emergency standby engines performing military launch tracking, and updating references. Staff is also proposing changes to the fuel requirements relative to the use of certain alternative diesel fuels in stationary CI engines, including the use of biodiesel and biodiesel blends.

Additionally, staff is proposing that local air districts be provided discretion in defining "maintenance and testing," and for exempting from the requirements of the ATCM stationary CI engines at test cell, test stand, and research and development facilities, and for stationary CI engines used exclusively for training at educational facilities.

Potential Changes to the Consideration of the use of Engines Enrolled in Demand Response Programs

It has been recently brought to the attention of ARB staff that a recent California Public Utilities Commission ruling has directed three California utilities to initiate reconsideration of utility demand response programs (DRP) for 2007 and 2008. As defined in the ATCM, a DRP is a program for reducing electrical demand using an interruptible service contract. Currently, two of these utilities, Pacific Gas and Electric, and Southern California Edison, do not participate in a DRP program. At this time, it is unclear how this ruling may affect the current DRP provisions in the ATCM.

At the hearing, staff may consider proposing additional changes to the Board regarding the use of engines enrolled in demand response programs. These changes may include allowances for the Executive Officer to approve additional hours of operation beyond those already provided for in the ATCM for DRP engines, requirements for prioritizing the use of DRP engines during Stage 2 or Stage 3 electrical alerts, or other changes as appropriate.

COMPARABLE FEDERAL REGULATIONS

Federal New Nonroad (Mobile) CI Engine Certification Standards

Federal nonroad CI engine certification standards set forth in the United States Code of Federal Regulations (CFR) Title 40, Chapter I, Part 89, Subpart B and Part 1039, Subpart B and California Off-Road CI Engine Certification Standards (title 13, CCR, section 2423) are the same with respect to standards and implementation schedules. The only areas of difference include mandatory labeling for "flexibility" and rebuilt engines in California.

The proposed Stationary Diesel Engine ATCM is expected to result in in-use agricultural engine replacement with new engines. Though compliant for the purposes of the certification standards, new "flexibility" engines would only be allowed if they meet the PM emission limit for the model year engine specified in the Stationary Diesel Engine ATCM. "Flexibility" engines are not expected to present a problem for implementation of the proposed amendments because such engines are required to be identified by labels.

Federal New Source Performance Standards (NSPS) for Stationary CI Internal Combustion Engines

U.S. EPA has recently adopted federal performance standards for new stationary CI internal combustion engines (Vol. 71, No. 132, July 11, 2006, FR 39154). The standards essentially require manufacturers of 2007 and later model year stationary engines, including those used in agriculture, to comply with the federal nonroad CI engine certification standards which are essentially the same as California Off-Road CI Engine Certification Standards as described above. By complying with the Stationary Diesel Engine ATCM, an owner/operator replacing an in-use agricultural engine would be complying with the NSPS.

Federal Fuel Standards

There are both federal and State fuel standards. The federal commercial fuel standards set forth in 40 CFR Part 80 require diesel fuel supplied to off-road engines (including stationary agricultural and other engines) to meet a 500 parts per million (ppm) sulfur limit beginning June 1, 2007. More stringent California fuel standards are set forth in title 13, CCR, sections 2281-2285. California diesel fuel standards establish a 15 ppm sulfur limit and a 10 volume percent aromatic hydrocarbon limit, or allow diesel fuel that provides equivalent or better emission performance. Fuel suppliers in California must provide diesel fuel that meets the more stringent California fuel standards. Fuel supplied as compliant California fuel also complies with less stringent federal standards. Pursuant to the existing Stationary Diesel Engine ATCM, nonagricultural stationary diesel engines in California are already subject to these fuel requirements. No issues are expected regarding owner/operator compliance with the in-use stationary diesel agricultural engine fuel-use requirements in the proposed amendments because only California-compliant fuel may be sold for use in the State.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The Board staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: Staff Report: Initial Statement of Reasons for Proposed Requirements for Stationary Diesel In-Use Agricultural Engines, September 2006.

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 ARB's website 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, California, 95814, (916) 322-2990 at least 45 days prior to the scheduled hearing on November 16, 2006.

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 website listed below.

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons: Richard Boyd, Manager, Process Evaluation Section, (916) 322-8285, rboyd@arb.ca.gov, for inquires regarding in-use agricultural engines or Ronald Hand, Air Pollution Specialist, Technical Analysis Section, (916) 327-6683, rhand@arb.ca.gov, for inquires regarding nonagricultural engines. 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 and Regulatory Coordination Unit, (916) 322-6070, or Alexa Malik, Regulations Coordinator, (916) 322-4011. 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 ARB Internet site for this rulemaking at http://www.arb.ca.gov/regact/agen06/agen06.htm.

Additional information about publications and activities related to the proposed amendments is available at http://www.arb.ca.gov/diesel/ag/inuseag.htm. You may request electronic mail messages to alert you to updates to this website by joining the electronic list serve at http://www.arb.ca.gov/listserv/inuseag.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 and private persons and businesses in reasonable compliance with the proposed amendments are presented below.

Pursuant to Government Code section 11346.5(a)(5), the Executive Officer has determined that the proposed amendments will possibly impose a mandate on local agencies or school districts. The Executive Officer has further determined pursuant to Government Code section 11346.5(a)(6) that the proposed regulations will result in some additional costs to the Air Resources Board and other state agencies. In addition, the Executive Officer has also determined pursuant to Government Code section 11346.5(a)(6) that the proposed regulatory action will possibly create a cost to

any local agency or school district that is required to be reimbursed under Part 7 (commencing with section 17500) of Division 4 of the Government Code or other nondiscretionary costs or savings imposed on local agencies. The Executive Officer further determined that the proposed amendments will not result in costs or savings in federal funding to the state.

The proposed amendments affect CI engines used in either non-agricultural or agricultural use; the amendments affecting non-agricultural engines are estimated to be cost-neutral or produce a slight cost savings to their owners/operators, and thus are not discussed below. The amendments affecting agricultural in-use engines are expected to impose costs upon those businesses or public entities as described below in the Fiscal Impact to Businesses Section, and are discussed below.

Fiscal Impact on Local Agencies or School Districts

The Executive Officer has determined that the proposed regulatory action will have an impact, although insignificant, on costs to local agencies or school districts since it will require a very small number of local agency or school districts to comply with the amended ATCM.

Some compliance (including reporting) costs may be incurred by a few local agencies and school districts, to the extent that they own or operate affected engines. Staff was unable to locate any affected agricultural in-use engines owned or operated by local agencies or school districts; therefore, staff believes that there may only be a few of these entities that will incur costs.

Fiscal Impact on State Agencies or Federal Funding to the State

Some relatively minor costs will occur for correctional facilities and universities (both the California State University (CSU) and University of California (UC) systems) that own or operate affected agricultural in-use engines. Staff has determined that less than 10 engines owned or operated by correctional facilities and universities would be affected. Since the compliance costs are insignificant compared to their overall budgets, we believe that the costs will be able to be met within their existing budgets. The proposed amendments will impose a cost to ARB for local air district implementation and enforcement assistance. These one-time costs to ARB primarily involve developing health risk screening materials and database tracking software for district use in their enforcement activities. These costs are estimated at approximately $62,000; ARB staff expects that the costs will be absorbed within the existing budget.

The Executive Officer has also determined that the proposed regulatory action will not create costs or savings in federal funding to the State.

Fiscal Impact to Businesses

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 developing this regulatory proposal, the ARB staff evaluated the potential economic impacts that representative private persons or businesses might incur in reasonable compliance with the proposed Stationary Diesel Engine ATCM. The Executive Officer has initially assessed that the proposed regulatory action will affect the businesses that operate the affected engines. The costs for businesses and individuals that operate or own the affected engines are estimated to be in the range of $34 million to $42 million, over a 22-year period, which results in an average cost-effectiveness of $11 per pound of diesel PM reduced (the cost-effectiveness range is from $1 to $22 per pound of diesel PM reduced). The cost for businesses and individuals is not expected to exceed $10 million in any one year.

In accordance with Government Code sections 11346.3 and 11346.5(a)(10), the Executive Officer has determined that the proposed regulatory action may lead to creation or elimination of some businesses. Due to the long lead-time for compliance, the range of compliance options available, and the availability of incentive funding, we believe that most businesses will be able to meet the compliance costs. However, it is possible that a small number of businesses (those with marginal profitability) may experience financial difficulty in complying with the proposed amendments. Businesses that may be created include those that furnish, install, and maintain diesel emission control systems, as well as those that provide alternative compliance strategies. Engine and approved emission control system manufacturers, distributors, and dealers are likely to see an increase in business due to accelerated attrition and other options to meet the in-use requirements of the proposed amendments.

The Executive Officer has also determined, pursuant to title 1, CCR, section 4, that the proposed regulatory action will have an impact on small businesses. We believe that a majority of the affected engine owners and operators are likely to be small businesses. ARB estimates the initial cost to a small (as well as a typical) business (owning one to three engines) to be within the range of $6,900 to $33,000 in 2006.

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), ARB's Executive Officer has found that the reporting requirements of the proposed amendments that apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

In accordance with Health and Safety Code section 43013(c), the Executive Officer has determined that the standards and other requirements in the proposed amendments are

necessary, cost-effective, and technologically feasible for agricultural operations (i.e., farm equipment).

A detailed assessment of the economic impacts of the proposed amendments can be found in the ISOR.

Fiscal Impact to Local Air Districts

There will be significant costs to the local air districts to implement and enforce the ATCM. Staff estimates that a district's costs to implement the registration program (initial registration) would be approximately $45 to $90 per engine. An additional cost of $26 to $242 would be needed to cover an inspection and registration update at the time of final compliance with the ATCM. State law allows the districts to charge fees to recover these costs. These costs would not impact SJVUAPCD or SCAQMD because these districts have already established registration or permitting programs similar to the registration program in the proposed amendments.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the board 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 email 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 15, 2006**, 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 submittal: http://www.arb.ca.gov/lispub/comm/bclist.php **no later than 12:00 noon, November 15, 2006.**

Facsimile transmissions are to be transmitted to the Clerk of the Board at (916) 322-3928 and received at ARB **no later than 12:00 noon November 15, 2006.**

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. 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 Health and Safety Code sections 39650-39675. This action is proposed to implement, interpret and make specific Health and Safety Code sections 39650-39675.

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 ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990.

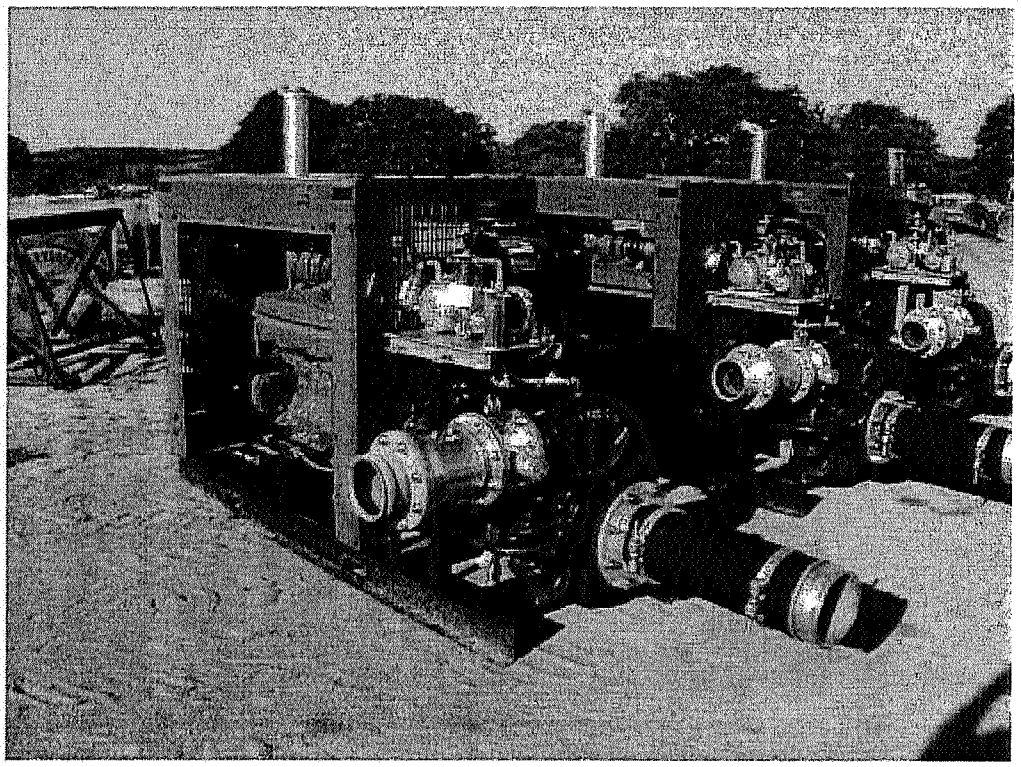
CALIFORNIA AIR RESOURCES BOARD

Catherine Witherspoon
Executive Officer

Date: September 19, 2006

California Environmental Protection Agency
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED REQUIREMENTS FOR STATIONARY DIESEL IN-USE AGRICULTURAL ENGINES



Stationary Source Division
Emissions Assessment Branch

September 2006

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

Public Hearing to Consider

PROPOSED REQUIREMENTS FOR STATIONARY DIESEL IN-USE AGRICULTURAL ENGINES

To be considered by the Air Resources Board on November 16-17, 2006, at:

California Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

Air Resources Board
P.O. Box 2815
Sacramento, California 95812

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State of California
AIR RESOURCES BOARD

PROPOSED REQUIREMENTS FOR STATIONARY DIESEL IN-USE AGRICULTURAL ENGINES

Staff Report

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Staff Report: Initial Statement of Reasons

Proposed Requirements for
Stationary Diesel In-Use Agricultural Engines

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State of California
AIR RESOURCES BOARD

Executive Summary

I. INTRODUCTION

The Air Resources Board (ARB or Board) staff is proposing to amend the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (Stationary Diesel Engine ATCM or existing ATCM). The Stationary Diesel Engine ATCM is part of ARB's ongoing effort to reduce diesel particulate matter (diesel PM) from diesel-fueled engines and vehicles. The existing ATCM was adopted in February 2004 and later amended in March 2005 and September 2005. In June 2005, the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and the South Coast Air Quality Management District (SCAQMD) Boards approved revisions to local rules that included oxides of nitrogen (NOx) emission standards for in-use agricultural engines. Although SJVUAPCD Rule 4702 and SCAQMD Rule 1110.2 do not specifically regulate diesel PM, they are expected to result in the replacement of older in-use agricultural engines with electric motors or new, cleaner diesel or other engines.

The primary purpose of the proposed amendments is to establish in-use stationary diesel agricultural engine emission standards in order to reduce diesel PM emissions, exposure, and health risk. ARB staff anticipates that most of the in-use stationary diesel agricultural engines affected by the proposed amendments are used to pump water for the irrigation of crops. The proposed amendments do not apply to diesel-fueled agricultural wind machines. Additionally, agricultural emergency standby generator set engines and remotely-located agricultural engines in federal attainment areas for PM and ozone are exempt from in-use agricultural engine emission limits, provided they are registered with their air pollution control or air quality management district (local air district) and meet monitoring and recordkeeping requirements.

The proposed ATCM uses the ARB/United States Environmental Protection Agency (U.S. EPA) off-road engine certification standards to determine which engines need to be replaced/upgraded, by when, and what emission limit must be met. The off-road engine certification standards are phased in as Tiers 1 through 4. The standards become more stringent as each tiered standard takes effect in four to five year increments. Pre-1996 engines are generally referred to as noncertified (Tier 0) engines because they were manufactured before the ARB/U.S. EPA off-road certification standards were effective.

As a result of the proposed amendments, most in-use stationary diesel agricultural engines, greater than 50 horsepower (hp), will meet Tier 3 or Tier 4 off-road compression ignition (CI) engine certification standards by 2022. An overview of these

standards is provided in Table 1 (page ES-3) and in Appendix C of the Staff Report. The proposed amendments include provisions for agricultural engine emission standards, local air district registration programs, paying registration fees assessed by local air districts for the purposes of implementing and enforcing the ATCM, and other requirements. Additionally, the proposed amendments require owners or operators to fuel their stationary diesel agricultural engines with California Air Resources Board-approved diesel fuel (also known as CARB diesel fuel) or another ATCM-compliant fuel. Staff is also proposing several minor changes to the existing ATCM to address clarity and implementation issues.

ARB staff expects that most growers will comply with the emission limits with the installation of a new stationary diesel engine that meets the applicable emission standards. Compliance with the emission standards may also be achieved with the installation of an electric motor. There are several incentive programs which could play an important role in providing early emissions reductions by encouraging growers to voluntarily replace existing noncompliant stationary diesel agricultural engines with electric motors or new, cleaner Tier 3- or Tier 4-certified engines. For example, two incentive programs, the Pacific Gas and Electric Agricultural Internal Combustion Engine or AG-ICE Conversion Incentive Program and the Southern California Edison Time-of-Use Pumping Agricultural Internal Combustion Engine or TOU-PA-ICE Program, provide reduced electricity rates and electrical line and service extension allowances for growers who voluntarily replace stationary diesel agricultural irrigation pump engines with electric motors. Incentive programs such as these are expected to encourage compliance with the proposed amendments and may also be used to help comply with SJVUAPCD and SCAQMD rules.

The proposed amendments will directly affect California farms and ranches using stationary diesel agricultural engines; primarily those using these engines to pump water for the irrigation of crops. Indirectly affected businesses include diesel engine manufacturers, dealers, and distributors; businesses that sell pumps and associated equipment; installation, maintenance, and repair services; and providers of electrical motors. Other potentially affected businesses include electric power providers, fuel suppliers, and those businesses providing diesel exhaust after-treatment devices for these engines.

Currently, approximately 8,600 stationary engines are operating to power irrigation pumps. Diesel PM and oxides of nitrogen (NOx) emissions from operation of these engines is approximately 1.6 tons per day and 33 tons per day, respectively. These engines are located mostly in the San Joaquin and South Sacramento valleys. After full implementation of this ATCM (2022) and the previously mentioned local air district rules, diesel PM emissions will be reduced to 0.4 tons per day and NOx will be reduced to 11 tons per day.

II. SUMMARY OF THE PROPOSED AMENDMENTS

A. In-Use Agricultural Engines

1. Background

Staff is proposing that in-use stationary diesel engines meet emission limits equal to or more stringent than the ARB and United States Environmental Protection Agency (U.S. EPA) new off-road CI engine Tier 3 or Tier 4 certification standards. These emission limits could be met by replacing an existing diesel engine with a new diesel engine or electric motor, switching to an alternative fuel, retrofitting an existing engine with emission controls, or using any other equally effective emissions control technology. Staff finds that the proposed emission limits represent best available control technology for in-use agricultural diesel engines.

The proposed ATCM uses the off-road engine certification standards to determine which engines need to be replaced, by when, and what emission limit must be met. The off-road engine certification standards are phased in as Tiers 1 through 4 standards. The standards become more stringent as each tiered standard takes effect in four to five year increments. Pre-1996 engines are generally referred to as noncertified (Tier 0) engines because they were manufactured before the ARB/U.S. EPA off-road certification standards were effective.

The tiered standards differ depending on horsepower size and engine application. Table 1 shows the tiered standards for PM and NOx for 175 horsepower (hp) through 299 hp off-road engines. About one-third of in-use agricultural pump engines are in the 175-299 hp size range. There are also alternative compliance paths that allow delays in meeting one requirement in exchange for accelerated implementation of another.

Table 1. 175-299 hp Off-Road Engine Standards and Effective Dates[1]

Category	Effective Date of Standard[1]	PM Standard g/bhp-hr	NOx Standard g/bhp-hr
Tier 0 (noncertified)	Pre-1996	NA Est. 0.55	NA Est. 11.0
Tier 1	1996	0.40	6.9
Tier 2	2003	0.15	4.8
Tier 3	2006	0.15	3.0
Tier 4	2011	0.01	0.30

1. Effective date varies depending on the horsepower range. The 175-299 hp range is presented as an example. See Appendix C of the staff report for the complete summary of the standards.

The ARB emission inventory shows approximately 12,500 diesel engines are used to power agricultural irrigation pumps Statewide. Approximately 8,600 of these pump engines are greater than 50 horsepower and stationary -- the majority (approximately 5,000) are operated in the San Joaquin Valley. The South Coast Air

Basin has a small number of greater than 50 hp stationary diesel-fired agricultural pump engines (18 of the Statewide total). Statewide, the average size of the diesel-fired pump engines is approximately 200 hp. The operation of these engines varies regionally and from year to year. The Statewide average operation of diesel agricultural pump engines is estimated to be about 1,000 hours per year. Table 2 shows the distribution of engine sizes currently operating in the State. Table 3 shows the distribution of engines currently operating in the State by emission rate standards.

Table 2. 2005 Statewide Distribution of Agricultural Engines by Size Category[1,2]

Horsepower Range	Percent of Statewide Engines	Total Engines
>50 to 74	4	340
75 to 99	4	340
100 to 174	48	4,130
175 to 750	44	3,800
>750	<1	2

1. Values have been rounded.
2. Baseline year 2003 engine population forecasted to 2005.

Table 3. Statewide Distribution of Agricultural Engines by Tier Standard

Engine Emission Level	Number of Engines	Percent of Total Engine Population
Tier 0 (pre-1996)	3,600	42
Tier 1 (1996-2005)	3,500	40
Tier 2 (2001-2010)	1,500	18

2. Emission Limits

The basic proposal requires Tier 0 engines to be replaced with Tier 3 engines, or an equally effective alternative (i.e. an electric motor, alternative fuel, non-diesel engine, or retrofit control system), in the 2011-2012 time frame. Tier 1 and 2 engines would be replaced with Tier 4 engines, or an equally effective alternative, in the 2014 -2015 time frame.

Engines that were built before 1996 would be required to comply first. Most Tier 0 stationary agricultural engines would be required to meet Tier 3 emission limits by

December 31, 2010 or 2011, depending on the horsepower range. Table 4 summarizes the PM emission limits and proposed compliance dates for Tier 0 engines.

Table 4. Proposed Emission Standards and Compliance Dates for Tier 0 (pre-1996) Agricultural Engines Except Generator Engines

Horsepower Range	PM Limit (g/bhp-hr)	Tier Level of Limit	Compliance Date
>50 to 74	0.30	Tier 3 or Interim Tier 4	Dec. 31, 2011
75 to 99	0.30	Tier 3	Dec. 31, 2011
100 to 174	0.22	Tier 3	Dec. 31, 2010
175 to 750	0.15	Tier 3	Dec. 31, 2010
>750	0.075	Tier 4	Dec. 31, 2014

We are proposing PM emission limits for Tier 0 agricultural engines that are used with electric generators different from the PM limits and compliance dates for non-generator engines. We are doing this to ensure that the emission requirements for engines used with electric generators in non-agricultural and agricultural applications are identical. Table 5 summarizes the PM emission limits and proposed compliance dates for Tier 0 agricultural engines used with an electric generator.

Table 5. Proposed Emission Standards and Compliance Dates for Tier 0 (pre-1996) Agricultural Generator Engines

Horsepower Range	PM Limit (g/bhp-hr)	Tier Level of Limit	Compliance Date
>50 to 74	0.02	Tier 4	Dec. 31, 2015
75 to 99	0.01	Tier 4	Dec. 31, 2015
100 to 174	0.01	Tier 4	Dec. 31, 2015
175 to 750	0.15	Tier 3	Dec. 31, 2010
>750	0.075	Tier 4	Dec. 31, 2014

Tier 1 and Tier 2 stationary agricultural engines would be required to meet Tier 4 standards by December 31, 2014 or 2015, again depending on the horsepower range. For Tier 1 or 2 engines that were purchased after 2002 or 2003, the compliance date would be 12 years after the date the engine was manufactured. Table 6 summarizes the PM emission limits and proposed compliance dates for Tier 1 and Tier 2 engines.

Table 6. Proposed PM Emission Standards and Compliance Dates for Tier 1 and Tier 2 Agricultural Engines

Horsepower Range	PM Limit (g/bhp-hr)	Tier Level of Limit	Compliance Date[1]
>50 to 74	0.02	Tier 4	Dec. 31, 2015
75 to 99	0.01	Tier 4	Dec. 31, 2015
100 to 174	0.01	Tier 4	Dec. 31, 2015
175 to 750	0.01	Tier 4	Dec. 31, 2014
>750	0.075	Tier 4	Dec. 31, 2014

1. Compliance date is the date listed or when the engine is 12 years old, whichever is later.

In addition to PM emission limits, the cleaner Tier 3 and Tier 4 engines will emit significantly less NOx. Table 7 shows the percent reduction in diesel PM and NOx when an older engine is replaced with a new engine.

Table 7. Percent Reduction in Diesel PM and NOx in Relation to Change in Certification Standard

Certification Standard Change	Percent PM Reductions	Percent NOx Reductions
Tier 0 to Tier 3	70	75
Tier 1 to Tier 4	97	95
Tier 2 to Tier 4	94	92
Tier 3 to Tier 4	94	90

3. Registration Requirements

Historically, agricultural engines have not been subject to local air district permitting or registration programs. As a result, most local air districts have limited data on the stationary diesel engines used in agricultural operations. In order to implement the proposed ATCM, there is a minimum set of information about the engine that local air districts will need. To ensure that this information is available, the proposed ATCM contains a requirement that all new and in-use stationary diesel agricultural engines be registered with the local air district. Under the registration program, engine owner/operators would be required to submit registration information for each new and in-use engine to the district which would provide at a minimum:

- Contact information of the engine owner/operator;
- Make, model, year, and horsepower of the engine;
- The annual hours of operation and fuel usage of the engine;
- The location of the engine; and

- Proximity of the engine to homes, schools, and hospitals.

Local air districts, at their discretion, would have the authority to assess fees to assist with implementation of the registration program as well as general implementation and enforcement of the ATCM. Accordingly, the ATCM requires that owner/operators pay any fees assessed for this purpose.

4. Residual Risk Provision

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588 or "Hot Spots" Program) was enacted in September 1987. Under the "Hot Spots" program, stationary sources are required to report the types and quantities of certain substances their facilities routinely release into the air. The goals of the program are to collect emission data, identify facilities having localized impacts, ascertain health risks, and notify nearby residents of significant risks. In September 1992, the California State Legislature modified the "Hot Spots" Program to address the reduction of significant risks. The modifications require owners of significant-risk facilities to reduce their risks to nearby receptors. The local air districts implement the "Hot Spots" program.

Depending on proximity to receptors, it is possible that some owner/operators who replace their Tier 0 engines with Tier 3 engines in accordance with the proposed amendments may still pose a risk to nearby receptors. Pursuant to the goals of the AB 2588 "Hot Spots" Program to address such risk issues, the proposed amendments contain a provision allowing local air districts, on a site-specific basis, to extend compliance with ATCM emission standards provided the engine meets Tier 4 engine Off-Road CI Engine Certification Standards for PM (i.e., 0.02 g/bhp-hr for an engine greater than 50 bhp but less than 75 bhp or 0.01 g/bhp-hr for an engine greater than or equal to 75 bhp) no later than four years after the otherwise applicable ATCM compliance date. Staff does not anticipate residual risk issues from Tier 4 engines with because they have very low PM emission rates. Compliance may also be satisfied with the installation of an electric motor.

5. Fuel Use Requirements

The proposed amendments require that owners and operators of all in-use stationary diesel agricultural engines use only California Air Resources Board or "CARB" diesel or another ATCM-compliant fuel. Because these are the only fuels legally available in the State, no compliance problems are expected with this requirement.

6. Recordkeeping, Reporting, and Monitoring Requirements

For the purposes of public outreach and compliance assurance, owners and operators of in-use stationary diesel agricultural engines will be subject to recordkeeping and reporting requirements. The recordkeeping and reporting requirements are similar to those for other stationary diesel engines in the existing ATCM. These requirements

include maintaining records of annual hours of operation. Monitoring requirements include technical specifications for hour meters and diesel particulate filters.

7. Exemptions

The proposed amendments do not apply to engines 50 hp and less or to diesel-fueled agricultural wind machines. The exclusion of 50 hp and less engines is consistent with the exemption provided for stationary non-agricultural engines. Staff does not believe that this will have any measurable impact on the emission reductions from in-use agricultural engines since most engines in this horsepower range are portable engines. Additionally, staff is not proposing requirements for in-use diesel-fueled wind machines because they are operated infrequently, located remotely (e.g., in the middle of orchards), and the emissions disperse rapidly due to the action of the fan.

Staff is proposing limited exemptions for in-use stationary diesel agricultural emergency standby generator set engines and remotely-located engines. Emergency standby engines used for agriculture would be exempt from the emission limits in the ATCM but would have to meet the registration and reporting requirements. Staff has not found any information to suggest that there is a large population of these engines or that they are operated frequently. As more information becomes available, we will reevaluate the appropriateness of this exemption.

The remote-location exemption would apply to in-use agricultural engines in areas that are in attainment of the federal ozone and PM standards. The engine would have to be located at least one-half (½) mile from the nearest receptor and either be limited to 200 hours per year if the engine is a Tier 0 or Tier 1 engine or 600 hours per year if the engine is a Tier 2 or Tier 3 engine. With these restrictions, staff estimates that the potential cancer risk would be below one chance per million. The owner would have to apply for the exemption, satisfy registration requirements, install an hour meter, and keep operating records. Operating records would be required to be available to local air districts and the ARB upon request. Should the engine ever exceed the operating hour limit, the exemption would expire and the owner would have to comply with the applicable provisions of the ATCM within 18 months.

8. Health Impacts

a. Emissions and Emission Reductions

ARB staff estimates that the proposed amendments, in conjunction with local air district regulations, engine replacement incentive programs, and a negative growth factor for California's agricultural industry will reduce diesel PM emissions from stationary diesel agricultural engines by about 60 percent by 2012 and by 80 percent by 2022. These actions will result in a total reduction of diesel PM of 440 tons per year. ARB staff also estimate that NOx emissions will be reduced by about 50 percent by 2012 and 70 percent by 2022 for a potential total reduction of 8,100 tons per year of NOx.

Tables 8 and 9 summarize diesel PM and NOx emissions and reductions for in-use stationary diesel agricultural engines.

Staff anticipates that the bulk of the emission reductions will occur sooner than the compliance dates. We believe that this will occur because incentive funding is tied to actions prior to the compliance dates in the ATCM. Therefore, staff anticipates that significant emission reductions will occur in the 2008-2010 and 2011-2012 timeframes.

Table 8. Projected Statewide Diesel PM Emissions and Emission Reductions[1,2]

Year	Uncontrolled Emissions TPD (TPY)[3]	Controlled Emissions TPD (TPY)	Emission Reductions From 2005 TPD (TPY)	Percent Emission Reductions (2005-2022)
2005	1.6 (570)	1.6 (570)	0	0
2012	1.3 (460)	0.7 (240)	0.9 (330)	60
2022	0.8 (300)	0.4 (130)	1.2 (440)	80

1. For in-use stationary diesel agricultural pump engines.
2. All values have been rounded.
3. Baseline year 2003 emissions forecasted to 2005.

Table 9. Projected Statewide NOx Emissions and Emission Reductions[1,2]

Year	Uncontrolled Emissions TPD (TPY)[3]	Controlled Emissions TPD (TPY)	Emission Reductions From 2005 TPD (TPY)	Percent Emission Reductions (2005-2022)
2005	33 (12,000)	33 (12,000)	0	0
2012	27 (10,000)	17 (6,200)	16 (5,800)	50
2022	19 (6,900)	11 (3,900)	22 (8,100)	70

1. For in-use stationary diesel agricultural pump engines.
2. All values have been rounded.
3. Baseline year 2003 emissions forecasted to 2005.

b. Potential Cancer Risk

Because a diesel PM monitoring technique is not currently available, diesel PM concentrations from diesel-fueled agricultural pump engines were estimated using computer modeling techniques. To estimate exposure and the associated cancer risk due to the operation of pump engines, staff used assumptions encompassing a fairly broad range of possible operating conditions. Based upon the assumptions and conditions evaluated, the results showed that engines operating at Tier 0 (noncertified) and Tier 1 certification emission rates could potentially cause significant health risks at the point of maximum impact. Table 10 shows the reduction of potential cancer risk as engines operate at the proposed lower emission standards. Based on the engine population distribution shown in Table 3, staff expects the regulation will result in more than an 85 percent reduction in cancer risk.

Table 10. Reduction of Potential Cancer Risk at Proposed Emission Standards

Emission Standard Change	Percent Reduction (%)
Tier 0 to Tier 3	73
Tier 1 to Tier 4	98
Tier 2 to Tier 4	93

To illustrate the potential near-source cancer risk, staff performed a risk assessment analysis on an example pump engine operating at 225 bhp. At Tier 4 emission standards (0.01 g/bhp-hr) and operating at 1,000 hours annually, Table 11 shows that the potential cancer risk is less than or equal to one in a million. However, for emission rates of 0.15 g/bhp-hr (Tier 2 and Tier 3) and higher (noncertified and Tier 1), potential risks can be significant. These risk values assume a continuous exposure duration of 70 years for a nearby resident and use the methodology specified in the 2003 OEHHA health risk assessment guidelines (OEHHA, 2003) and the ARB Interim Risk Management Policy (ARB, 2003d).

Table 11. Potential Cancer Risks from In-Use Agricultural Engines[1,2]

Emission Standards	Distance from Source (meters)				
	100	400	800	1200	1600
Noncertified	67	13	6	4	3
Tier 1	49	10	5	3	2
Tier 2 and Tier 3	19	4	2	1	< 1
Tier 4	1	< 1	< 1	< 1	< 1

1. Assumes 1000 hours of operation and Fresno meteorology data.
2. Potential cancer risk in chances per million 70-year exposure duration.

As shown on Table 11, the potential cancer risk of a Tier 4 engine operating 1,000 hours per year is below one chance per million at 400 meters (approximately ¼ mile). The risk would still be less than one chance per million if the annual hours of operation were doubled (2,000 hours).

9. Environmental Impacts

No significant adverse environmental impacts are expected to occur from adoption of, and compliance with, the proposed requirements for in-use agricultural engines. Implementation of the proposed amendments would reduce directly emitted and secondarily formed PM levels, provide both near source and regional risk reduction, and contribute to the overall effort of reducing PM mortality, hospital admissions, and lost work days. Additionally, reductions in NOx and ROG from in-use stationary diesel agricultural engines as a result of the proposed amendments would contribute to

reducing exposures to ambient ozone. Emissions of NOx and ROG are precursors to the formation of ozone in the lower atmosphere and diesel engine exhaust contributes to ozone precursors. 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.

10. Economic Impacts

Both the compliance costs and emission reductions associated with the economic impacts discussed in this staff report are for all geographic areas and local air pollution control districts within California except for the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and the South Coast Air Quality Management District (SCAQMD). The projected costs and emission reductions for these two districts are omitted from the economic impacts discussion due to the presence of existing district rules that include the same engines that are covered by the proposed amendments.

Table 12 presents estimates of the per engine cost to comply with the proposed ATCM. These costs assume that existing engines will be replaced with new diesel engines and do not account for any incentive funding.

Table 12. Estimated Cost-Per-Engine for Affected Businesses[1,5]

In-Use Engine Size (HP)	Capital Cost Range [2] ($)	Annual Cost Range [3] ($)
50 - 74	6,900 - 8,200	1,200 - 2,100
75 - 99	4,300 - 9,600	1,200 - 1,700
100 - 174	8,000 - 12,700	1,800 - 2,200
175 - 299	11,300 - 18,000	2,600 - 3,300
300 - 599	16,600 - 26,500	3,800 - 4,300
600 - 750	20,500 - 32,700	4,700 - 5,300
>750 (1725)[4]	21,700 - 172,200	21,500 - 26,900

1. Estimates include prorated loss-of-use costs for an in-use engine, one rebuild, and initial air district fees.
2. The capital cost estimate assumes a lump-sum, one-time cost.
3. This is the capital cost amortized over the remaining expected useful life of the engine, which, depending on the specific engine size category and emissions tier, varies from one to eight years. Includes a range of expected local air district fees and owner/operator time to prepare and submit registration forms and other air district paperwork. A real interest rate of five percent is used. The estimated amount represents uniform annual payments to cover the capital cost and local air district fees.
4. For the greater than 750 HP category, an engine size of 1,725 hp is used for calculation purposes. This is the largest size engine expected in this category.
5. Values have been rounded; for exact figures, please refer to the "Per-Engine Costs" worksheet in Appendix F.

Staff estimates that the total cost of the proposed amendments to affected businesses would range from $34 million to $42 million over the 22-year analysis period used (i.e., 2008-2029). No significant economic impacts are expected for school districts, local public agencies, universities, State agencies, or federal agencies because few, if any, of these agencies operate affected engines. ARB administrative costs for outreach, educational efforts, and technical assistance are estimated to be a one-time cost of approximately $62,000 and would be absorbed within existing budgets and resources.

There will be significant costs to local air districts to implement and enforce the ATCM. Staff estimates that local air districts costs to implement a registration program (initial registration) would be approximately $45 to $90 per engine for the first year. An additional annual cost of $26 to $242 per engine (after the first year) is estimated to cover an inspection and registration update at the time of final compliance with the ATCM. State law allows the local air districts to charge fees to recover these costs. These costs would not impact the SJVUAPCD and SCAQMD because these districts have already established registration or permitting programs similar to the registration program in the proposed amendments.

Staff estimated cost-effectiveness of the proposed amendments in terms of cost per pound of diesel particulate matter (PM) reduced. Diesel PM reductions from the proposed amendments have been estimated to range from 31 tons per year (tpy) to 124 tpy between 2011-2029 for all areas of the State except for the San Joaquin Valley Unified Air Pollution Control District and the South Coast Air Quality Management District. Considering only the benefits of reducing primary diesel PM emissions, the average cost-effectiveness of the proposed amendments is $11 per pound of diesel PM reduced (the cost-effectiveness range is from $1 to $22 per pound of diesel PM reduced). These values are on the lower end of cost for similar measures the Board has approved.

11. Alternatives to the Proposed Amendments

ARB staff considered two alternatives to the proposed in-use agricultural engine emission standards: not requiring emission standards or requiring that all stationary diesel agricultural engines be replaced with electric motors.

The no action alternative would not be consistent with the goals outlined in the Diesel Risk Reduction Plan and would not adequately ensure Statewide reductions in diesel PM from this source category. It would result in many older, dirtier diesel engines continuing to operate throughout the State. The elevated PM levels would contribute to incidence of lung cancer and other adverse health impacts.

From an air quality and health risk perspective, ARB staff supports electrification as a control strategy. Electrification is currently supported by the availability of voluntary incentive programs. An example of these voluntary approaches can be found in two utility incentive programs, the Pacific Gas and Electric Agricultural Internal Combustion Engine or AG-ICE Conversion Incentive Program and the Southern California Edison Time-of-Use Pumping Agricultural Internal Combustion Engine or TOU-PA-ICE Program. These incentive programs provide reduced electricity rates and electrical line and service extension allowances for growers who voluntarily replace stationary diesel agricultural irrigation pump engines with electric motors. These programs are designed to work in conjunction with ARB's Carl Moyer Program and other programs that provide funding toward the purchase of electric motors.

Switching from diesel to electric power would virtually eliminate in-use agricultural engine diesel PM and other emissions. However, staff found that operational and cost obstacles associated with switching from diesel engines to electric motors exist for some agricultural operations. Therefore, rather than an all electric option, ARB staff has proposed emission standards that may be met using a variety of compliance strategies, including: replacement with electric motors, cleaner diesel engines, or spark-ignited engines; retrofit with add-on diesel PM control devices; and use of alternative fuels.

B. Other Proposed Amendments

1. Background

As previously mentioned, the proposed amendments also include several additional changes to improve the clarity of some provisions in the ATCM and facilitate implementation and enforcement. These additional amendments are motivated by a number of issues that have been raised by the local air districts, engine manufacturers, and industry representatives regarding the implementation the ATCM. Staff concluded from discussion with the various interested parties that the ATCM should be amended to adequately resolve these issues.

The proposed additional amendments are intended to clarify the applicability of the ATCM, and to improve implementation and enforcement of the ATCM. The additional amendments do not impose any new standards, implementation timelines, or other requirements. As such, no health, environmental, or economic impacts are expected from the proposed additional amendments.

2. Proposed Amendments

Based on staff consultations with interested parties and to address implementation and compliance issues, staff is proposing to:

- Streamline the fuel reporting requirements for emergency standby engines;
- Update references to the tariff schedule established by the California Public Utilities Commission as it relates to the Rolling Blackout Reduction Program (RBRP);
- Add a new subsection to the definition of "maintenance and testing" that allows local air districts the discretion to not count additional hours of operation necessary to ensure operability of a repaired emergency generator as "maintenance and testing;"
- Harmonize the definition of CARB diesel fuel in the ATCM to be consistent with ARB fuel regulations;
- Provide for new sell-through provisions;
- Add a new compliance option to meet the 0.01 g/bhp-hr diesel PM standard for new and in-use prime and emergency standby engines;
- Clarify the definition of "emergency use" for emergency standby engines at United States Department of Defense facilities performing launch tracking, and

provide a schedule to have these engines meet the 0.01 g/bhp-hr diesel PM standard by December 31, 2009;
- Provide local air districts the discretion to exempt certain stationary CI engines used for: testing burners or CI engines; the testing of fuels, fuel additives, or emission control devices at research and development facilities; and training at educational facilities;
- Provide for the use of biodiesel, biodiesel blends, Fischer-Tropsch diesel, and emulsified diesel without verification; and
- Update references.

It should be noted that two of the proposed amendments listed above provide local air districts with discretionary authority when implementing the ATCM. Additionally, given the administrative nature of the additional amendments, there were no practical alternatives to consider.

At the hearing, staff may consider proposing additional changes to the Board regarding the use of engines enrolled in demand response programs. These changes may include allowances for the Executive Officer to approve additional hours of operation beyond those already provided for in the ATCM for utility demand response programs (DRP) engines, requirements for prioritizing the use of DRP engines during Stage 2 or Stage 3 electrical alerts, or other changes as appropriate.

III. KEY ISSUES

A. Remotely-located/Low-use Engines

During our public workshops, engine owners raised an issue about engines that are operated infrequently or are remotely located. Owners indicated that their diesel engines were operated very few hours per year except in drought years when surface water was not available. These engine owners felt that replacing these infrequently operated engines would create a financial hardship. They also expressed the concern that this hardship was compounded by the fact that due to the limited hours of operation they would not qualify for incentive funding.

In an effort to address this issue, staff is proposing a remotely located engine provision for engines in areas that are in attainment of the federal ozone and PM standards. As previously discussed, If there are no receptors within ½ mile (2,640 feet) of the engine, the engine may qualify for a remote-location exemption. Tier 0 and Tier 1 engines that operate no more than 200 hours per year and Tier 2 and Tier 3 engines that operate no more than 600 hours per year would not have to meet the emission limits in the proposed ATCM. However, the engine would need to be registered with the local air district and have a hour meter installed. Additionally, the owner or operator would be required to keep records of annual hours of operation, notify the local air district if the engine operates more than the allowed number of hours, and install a new compliant engine (within 18 months) if the allowed operating hours are exceeded.

IV. PUBLIC OUTREACH

Since the amendments to the ATCM in September 2005, ARB staff has been working collaboratively with the various stakeholders to identify the issues and develop proposed draft language. The proposed amendments have been discussed with the California Air Pollution Control Officers Association (CAPCOA) during several joint CAPCOA/ARB conference calls. Additionally, ARB staff made extensive contacts with industry representatives, local air districts, environmental/pollution prevention and public health advocates, and other interested parties through meetings, telephone calls, and electronic mail. Furthermore, staff held two public consultation meetings (specifically geared to farmers and their concerns) and four public workshops to discuss amendments to the ATCM. Finally, to further expand public outreach opportunities, staff made information available via ARB's web site (http://www.arb.ca.gov/diesel/ag/inuseag.htm).

V. ENVIRONMENTAL JUSTICE

A public process that involves all parties affected by the proposed ATCM is an important component of ARB rulemaking activities. The proposed amendments are consistent with the ARB's environmental justice policy to reduce health risks from toxic air contaminants (TAC) in all communities, including low-income and minority communities. The proposed amendments will reduce diesel PM and other emissions from in-use stationary diesel agricultural engines in all areas of the State where these engines are located. The amount of emission reduction in low-income, minority, and other communities will depend on the number and use of stationary diesel agricultural engines in the area.

VI. IMPLEMENTATION AND ENFORCEMENT

To efficiently and effectively implement the proposed ATCM, we believe that the following actions need to be taken by ARB staff:

- Immediately begin an outreach program to inform farmers and engine suppliers of the requirements of the ATCM and incentive funding options such as the Ag-ICE and Carl Moyer programs;
- Encourage the installation of electric motors for engines that are in close proximity to residential areas, schools, and hospitals;
- Develop registration guidance and risk analysis screening tools to assist local air districts and engine owner/operators;
- Support local air district actions to establish fees to implement and enforce the ATCM; and
- Provide oversight and assistance as needed.

VII. RECOMMENDATION

We recommend the Board approve the proposed amendments to the ATCM presented in Appendix A of the staff report. The addition of in-use stationary diesel agricultural engine emission standards will reduce diesel PM and other air pollutant emissions, exposure, and health risk across California, particularly in areas where agriculture is a major industry. Additionally, the other proposed amendments help to improve the clarity, implementation, and enforcement of the ATCM. The other proposed amendments are necessary additions and/or changes to clarify the intentions of the adopted ATCM. ARB staff believes the proposed amended ATCM is technologically feasible and necessary to carry out the Board's responsibilities under State law.

I. INTRODUCTION

A. Overview

This report provides the basis for the California Air Resources Board (ARB or Board) staff's proposal to amend the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM) to add in-use stationary diesel agricultural engine requirements. As part of this action, staff is also proposing other clarifying modifications to the existing ATCM requirements in order to improve clarity, implementation, and enforcement.

This report discusses the existing ATCM, California's estimated in-use stationary diesel agricultural engine population and emissions, the regulatory proposal to reduce emissions from these agricultural engines, regulatory alternatives considered, potential environmental and economic impacts, and other proposed changes to the ATCM. In addition, the information in Staff Report: Initial Statement of Reasons for Proposed Rulemaking – Airborne Toxic Control Measure for Stationary Compression Ignition Engines, September 2003, and Staff Report: Initial Statement of Reasons for Proposed Revisions to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines, April 2005, are hereby incorporated into this report by reference. The proposed amendments are presented in Appendix A and explained in Chapter IV of this Staff Report.

B. Existing Control Measure for Stationary Compression Ignition Engines

1. Initial Adoption

At a public hearing on February 26, 2004, the Board adopted the ATCM for Stationary Compression Ignition Engines in accordance with California's Toxic Air Contaminants Program. The ATCM is designed to reduce particulate matter (diesel PM) emissions from diesel-fueled engines by establishing best available control technology (BACT)-based PM emission performance standards for new and in-use stationary compression ignited engines.

Among other provisions, the ATCM contained a 0.15 grams per brake horsepower-hour (g/bhp-hr) PM standard for new stationary diesel agricultural engines. Just prior to the effective date of the standard (i.e., January 1, 2005), local air districts and agricultural engine distributors notified ARB of their concerns about the availability of compliant greater than 50 to less than 175 bhp diesel agricultural pump engines. During an extensive investigation, ARB staff found very limited availability of 0.15 g/bhp-hr PM-compliant new stationary diesel agricultural pump engines in the greater than 50 to 99 bhp size range and limited availability in the 100 to less than 175 bhp size range. The limited availability of compliant engines posed technical and cost issues, particularly regarding engine replacement.

2. Emergency Action

At a public hearing on March 17, 2005, the Board approved temporary emergency regulatory changes to the ATCM to maintain the public health benefits being achieved as a result of voluntary agricultural engine replacement incentive programs and to prevent disruption and economic hardship for farmers and agricultural equipment distributors and dealers. These emergency changes replaced the 0.15 g/bhp hr PM standard for small to medium new stationary diesel agricultural pump engines with ARB/federal new off-road/nonroad compression ignition engine certification standards of 0.30 g/bhp-hr PM for engines greater than 50 to 99 bhp and 0.22 g/bhp-hr PM for engines 100 to less than 175 bhp (the Board has adopted new off-road compression ignition engine certification standards identical to federal new nonroad compression ignition engine certification standards). The emergency changes allowed diesel PM emission and exposure reductions to continue by eliminating the technical and economic obstacles to the voluntarily replacement of older, dirtier, uncontrolled diesel agricultural engines with new, cleaner engines certified to ARB/federal standards (the existing ATCM provides emission performance standards for new stationary diesel agricultural engines but does not require that existing older agricultural engines be replaced).

At a public hearing on May 26, 2005, the Board approved amendments consistent with the emergency changes to the ATCM. Among other provisions, the amendments replaced the 0.15 g/bhp-hr PM standard for all greater than 50 to less than 175 bhp new stationary diesel agricultural engines (except generator sets) with new off-road engine PM certification standards. New stationary diesel agricultural generator sets remained subject to the 0.15 g/bhp-hr PM standard. ARB's regulatory advisory, Amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines, August 2005, contains a summary of all of the amendments adopted at the May 2005 Board hearing. A copy of the regulatory advisory is available at http://www.arb.ca.gov/diesel/dieselag/ag.htm. A copy of the ATCM, effective September 9, 2005, is available at http://www.arb.ca.gov/diesel/dieselag/ag.htm.

C. Summary of Proposed Amendments

During the February 26, 2004, public adoption hearing, the Board directed ARB staff to investigate the opportunities and challenges associated with replacing California's existing (i.e., in-use) population of stationary diesel agricultural engines with electric motors. During its investigation, ARB staff identified many variables associated with farm and ranch electrical power use in California (see Chapters III and IV of this Staff Report). Because of these variables, ARB staff concluded that any decision about the relative desirability or difficulty of converting stationary diesel agricultural engines to electric motors must be made on a site-by-site basis (ARB, 2004).

ARB staff also investigated other possible means of reducing diesel exhaust emissions, exposure, and health risk from this source, including voluntary incentive programs. An example of voluntary approaches can be found in two utility incentive programs, the

Pacific Gas and Electric Agricultural Internal Combustion Engine or AG-ICE Conversion Incentive Program and the Southern California Edison Time-of-Use Pumping Agricultural Internal Combustion Engine or TOU-PA-ICE Program. These incentive programs provide reduced electricity rates and electrical line and service extension allowances for growers who voluntarily replace stationary diesel agricultural irrigation pump engines with electric motors. These programs are designed to work in conjunction with ARB's Carl Moyer Program and other programs that provide funding toward the purchase of electric motors.

As a result of this investigation and discussions with stakeholders, ARB staff is proposing emission performance standards for in-use stationary diesel agricultural engines (except wind machines, emergency standby generator sets, and remotely-located engines) that may be met by a variety of compliance options, including electrification, replacement with new engines, retrofit, use of an alternative fuel (e.g., natural gas, propane), and use of an alternative diesel fuel use. Tables I-1 and I-2 summarize the proposed emission performance standards.

Table I-1. Proposed Emission Standards for Noncertified Greater than 50 bhp In-Use Stationary Diesel-Fueled Engines Used in Agricultural Operations

Horsepower Range	Application	Compliance On or After December 31	Diesel PM Not to Exceed (g/bhp-hr)	NOx Not to Exceed (g/bhp-hr)
Greater Than 50 But Less Than 75	Generator Sets	2015	0.02	Off-Road CI Engine Certification Standards for an off-road engine of the same model year and maximum rated power[1,2]
	All Other Applications	2011	0.30	
Greater Than or Equal to 75 But Less Than 100	Generator Sets	2015	0.01[3]	
	All Other Applications	2011	0.30	
Greater Than or Equal to 100 But Less Than 175	Generator Sets	2015	0.01[3]	
	All Other Applications	2010	0.22	
Greater Than or Equal to 175 But Less Than or Equal to 750	All Applications	2010	0.15	
Greater Than 750	All Applications	2014	0.075	

1. If no limits have been established for an off-road engine of the same model year and maximum rated power, then the in-use stationary diesel-fueled engine used in an agricultural operation shall not exceed Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power irrespective of model year.
2. Standards also apply to HC, NMHC+NOx, and CO
3. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

Table I-2. Proposed Emission Standards for Tier 1- and Tier 2-Certified Greater than 50 bhp In-Use Stationary Diesel-Fueled Engines Used in Agricultural Operations - All Applications

Horsepower Range	Compliance On or After December 31	Diesel PM Not to Exceed (g/bhp-hr)	NOx Not to Exceed (g/bhp-hr)
Greater Than 50 But Less Than 75	2015 or 12 years after the date of initial installation, whichever is later	0.02	Off-Road CI Engine Certification Standards for an off-road engine of the same model year and maximum rated power[1,2]
Greater Than or Equal to 75 But Less Than 175	2015 or 12 years after the date of initial installation, whichever is later	0.01[3]	
Greater Than or Equal to 175 But Less Than or Equal to 750	2014 or 12 years after the date of initial installation, whichever is later	0.01[3]	
Greater Than 750	2014 or 12 years after the date of initial installation, whichever is later	0.075	

1. If no limits have been established for an off-road engine of the same model year and maximum rated power, then the in-use stationary diesel-fueled engine used in an agricultural operation shall not exceed Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power irrespective of model year.
2. Standards also apply to HC, NMHC+NOx, and CO
3. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

The proposed amendments also include provisions for local air district agricultural engine registration programs and paying registration fees assessed by local air districts for the purposes of implementing and enforcing the ATCM. Additionally, the proposed amendments require owners or operators to fuel their stationary diesel agricultural engines with California Air Resources Board-approved diesel fuel (also known as CARB diesel fuel) or another ATCM-compliant fuel.

In June 2005, the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and the South Coast Air Quality Management District (SCAQMD) Boards approved revisions to local rules that included oxides of nitrogen (NOx) emission standards for in-use agricultural engines. Although SJVUAPCD Rule 4702 and SCAQMD Rule 1110.2 differ from the proposed amendments in that they do not specifically regulate diesel PM, they are nonetheless expected to result in the replacement of older in-use agricultural engines with electric motors or new, cleaner diesel or other engines.

D. Need for Proposed Amendments

Diesel PM is one of a complex mixture of potentially harmful inorganic and organic compounds in diesel exhaust emitted from several sources, including agricultural

engines. These engines are used in the growing of crops or the raising of fowl or animals. In California, in-use stationary diesel agricultural engines are primarily used to pump water for irrigating crops. In contrast to many nonagricultural engines that are used near commercial and residential centers on a frequent basis, agricultural engines are typically operated in remote locations on a limited basis depending on the growing season and crop irrigation requirements. ARB staff estimates that approximately 8,600 greater than 50 horsepower (hp) stationary diesel agricultural irrigation pump engines are located in California (year 2005). Of these engines, an estimated 42 percent are pre-1996 uncontrolled (i.e., noncertified engines). See Chapter III and Appendix D of this Staff Report for more information.

Implementation of the proposed amendments would reduce directly emitted and secondarily formed PM levels, provide both near source and regional risk reduction, and contribute to the overall effort of reducing PM mortality, hospital admissions, lost work days due to exposure to PM, and adverse public health and environmental effects associated with the use of stationary diesel agricultural engines. Additionally, reductions in NOx and ROG from in-use stationary diesel agricultural engines as a result of the proposed amendments would contribute to reducing exposures to ambient ozone. No existing or proposed federal, State, or local air district control measures specifically addresses diesel PM emissions from these agricultural engines.

II. REGULATORY STATUS AND PUBLIC OUTREACH

This chapter discusses the Air Resources Board's (Board or ARB) regulatory authority and relevant federal, State, and local air quality regulations and programs. In addition, this chapter describes the outreach efforts the ARB staff made to provide industry, local air districts, other stakeholders, and the general public with opportunities to participate in the development of the proposed amendments.

A. Regulatory Authority

The California Health and Safety Code (H&SC) provides the ARB with the authority to adopt the proposed amendments to the ATCM. Health and Safety Code sections 39600 (General Powers) and 39601 (Standards, Definitions, Rules, and Measures) confer to the ARB the general authority and obligation to adopt rules and measures necessary to execute the Board's powers and duties imposed by State law.

California's Toxic Air Contaminants Program, established under California law by AB 1807 (Stats. 1983, Ch. 1047) and set forth in Health and Safety Code sections 39650 through 39675, mandates the identification and control of toxic air contaminants (TAC) in California. The Air Toxics "Hot Spots" Information and Assessment Act (Health and Safety Code 44300-44394) allows for the collection of emissions data to identify facilities having localized impacts, to ascertain risks and to notify nearby residents of significant risks. Owners of significant-risk facilities would then have to reduce their risks below the level of significance.

The identification phase of the Toxic Air Contaminants Program requires ARB, with participation of other State agencies, such as the Office of Environmental Health Hazard Assessment (OEHHA), to evaluate the health impacts of, and exposure to, substances and to identify those substances that pose the greatest health threat as TACs. ARB's evaluation is made available to the public and is formally reviewed by the Scientific Review Panel (SRP) established under Health and Safety Code section 39670. Following ARB's evaluation and SRP's review, the Board may formally identify a TAC at a public hearing. Following identification of a substance as a TAC, Health and Safety Code sections 39658 and 39665 require ARB, with the participation of the air pollution control and air quality management districts (local air districts), and in consultation with affected sources and interested parties, to prepare a report on the need and appropriate degree of regulation for that substance. This assessment is known as the risk management phase.

In August 1998, the Board identified diesel particulate matter (PM) as a TAC and, in October 2000, ARB staff published the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel Engines and Vehicles (Diesel Risk Reduction Plan) (ARB 2000). The Diesel Risk Reduction Plan was the initial product of the risk management phase and serves as the needs assessment under the AB 1807 process. In the Diesel Risk Reduction Plan, ARB staff recommended control measures to reduce

diesel PM from a variety of diesel vehicles and engines, including new and in-use stationary diesel agricultural engines.

In 1999, California's Toxic Air Contaminants Program was amended by Senate Bill 25 (Stats. 1999, Ch. 731) to provide additional requirements for further consideration of health impacts to infants and children. As part of these requirements, in October 2001, OEHHA published the Prioritization of Toxic Air Contaminants Under the Children's Environmental Health Protection Act. In this report, OEHHA designated diesel PM as one of five priority TACs that "may cause infants and children to be especially susceptible to illness" (OEHHA 2001). Additional requirements established by Senate Bill 25 (H&SC §39669.5) direct ARB to adopt control measures, as appropriate, to protect public health, particularly infants and children, from priority TACs.

During regulatory development, staff considered the Diesel Risk Reduction Plan, statutes, and additional details specific to the regulation of in-use stationary diesel agricultural engines as reflected in this Technical Support Document. ARB staff proposes these amendments to the ATCM as one of several measures to fulfill the goals of the Diesel Risk Reduction Plan authorized by, and in compliance with, the requirements of Health and Safety Code sections 39666 and 39669.5 to prevent endangerment to public health.

B. Summary of Relevant Regulations and Programs

This section briefly summarizes significant regulations and programs relevant to ARB staff's proposal to add emission standards and other requirements for in-use stationary diesel agricultural engines to the ATCM. Further information regarding the regulatory framework for stationary compression ignition engines in general is available in Chapter III of Staff Report: Initial Statement of Reasons for Proposed Rulemaking – Airborne Toxic Control Measure for Stationary Compression Ignition Engines, September 2003.

1. Federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE)

The NESHAP for Stationary RICE (40 CFR Part 63, Subpart ZZZZ) only affects stationary diesel engines greater than 500 brake horsepower (bhp), installed or reconstructed on or after December 19, 2002, and located at a major source of hazardous air pollutants. Affected engines must comply by August 16, 2004, or upon start up, if initial installation occurs after August 16, 2004. Generally, the NESHAP requires either 70 percent or more reduction in carbon dioxide emissions or compliance with a 580 parts per billion by volume (ppbv) formaldehyde exhaust emission limit, initial and periodic testing, monitoring, recordkeeping, and reporting. The NESHAP does not address PM emission limits. Further details may be found in the final rulemaking for the NESHAP (Vol. 69, No. 114, June 15, 2004, FR 33474).

Because of the size, age, and location of most California in-use stationary diesel agricultural engines, very few are expected to be subject to the NESHAP for Stationary RICE requirements. In contrast, all of California's approximately 8,600 greater than 50 bhp in-use stationary diesel agricultural irrigation pump engines and a very small number of nonemergency generator set engines would be subject to the proposed amendments to the ATCM. Also, in contrast to the NESHAP, the proposed amendments to the ATCM primarily address diesel PM emissions although other toxic substances in diesel exhaust are also likely to be reduced.

2. New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines

The federal performance standards for new stationary compression ignition internal combustion engines (40 CFR Parts 60, 85, 94, 1039, 1065, and 1068) apply to owners or operators of engines constructed, modified, or reconstructed after July 11, 2005, and to manufacturers of 2007 and later model year engines. The NSPS affects all sizes and types of new stationary compression ignition engines, including those used in agricultural operations. In general, the stationary compression ignition engine NSPS for oxides of nitrogen (NOx), PM, carbon monoxide (CO), non-methane hydrocarbons (NMHC) or NMHC+NOx require the same levels of exhaust emissions as federal/California new nonroad/off-road mobile engine certification standards (see Section II.B.3 and Appendix C). Further detail may be found in the final rulemaking for the NSPS (Vol. 71, No. 132, July 11, 2006, FR 39154).

Although a variety of options are available for complying with the proposed ATCM, most growers are expected to meet the proposed standards through the replacement of noncertified and Tier 1- and Tier-2-certified engines with electric motors or new, cleaner engines that meet Tier 3 or Tier 4 certification standards. Since the proposed ATCM requires new engines to meet the off-road certification standards in effect at the time the engine is purchased, compliance with the ATCM would also result in compliance with the NSPS.

3. Federal Nonroad/California Off-Road New Mobile Engine Certification Standards

This brief discussion of federal and California exhaust emission standards for new nonroad/off-road mobile engines has been provided because these certification standards have been referenced in regulations affecting stationary engines, including stationary diesel agricultural engines. Examples of such regulations include the federal NSPS for stationary compression ignition engines, San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Rule 4702, and ARB staff's proposed amendments for in-use stationary diesel agricultural engines.

For the purpose of regulation, diesel and other internal combustion engines are typically classified as either stationary or mobile. Mobile engines are further divided into on-road and nonroad (also known as "off-road") engines. On-road engines are used in vehicles

designed to travel on highways and other roads. Nonroad engines are designed for off-road use. As a practical matter, the very same engine model is commonly used for both stationary and mobile nonroad or "portable" applications. Since most of the engines manufactured in the United States are used in mobile engine applications, it makes sense for stationary compression ignition engine regulations to require the same exhaust emission levels as those already established for mobile nonroad engines.

Federal certification standards for new nonroad mobile compression ignition (CI) engines are set forth in the United States Code of Federal Regulations (CFR) Title 40, Chapter I, Part 89, Subpart B and Part 1039, Subpart B. California Off-Road CI Engine Certification Standards for the same subset of engines are set forth in title 13, section 2423 of the California Code of Regulations (CCR). Federal and California certification standards consist of exhaust limits expressed in grams per kilowatt-hour (g/kw-hr) for PM, HC, NOx, HC+NOx, or NMHC+NOx. The standards vary depending on engine size (i.e., brake horsepower), model year, and pollutant. Federal and California standards have been harmonized (i.e., essentially equivalent across engine sizes) since 1999. Over time, these certification standards become more stringent in four phases or "tiers" according to engine size and model year. For example, Tier 2 standards are currently in effect for engines less than 175 and greater than 750 bhp and Tier 3 standards are currently in effect for engines greater than or equal to 175 but less than 750 bhp. An overview of off-road CI engine certification standards is presented in Appendix C of this staff report.

Both the federal and California nonroad/offroad CI engine certification standard regulations allow engine manufacturers to participate in a Tier 4 Averaging, Banking, and Trading Program. This program provides flexibility in complying with emissions standards while achieving overall emission reduction goals by allowing some engine models to exceed Tier 4 standards if their emissions would be offset by cleaner-than-required engine models of the same manufacture.

Though compliant for the purposes of the certification standards, new "flexibility" engines would only be allowed if they meet the PM emission limit for the model year engine specified in the ATCM. "Flexibility" engines are not expected to present a problem for implementation of the proposed amendments because such engines are required to be identified by labels in California.

4. Federal and California Fuel Standards

Fuel standards for aromatic content, sulfur and other fuel components play a critical role in meeting exhaust emission limits. While federal and California fuel standards specifically apply to fuel producers and distributors, the existing ATCM additionally requires new stationary diesel-fueled agricultural engines and other diesel-fueled engines to use CARB Diesel Fuel or verified alternative diesel fuels. The proposed amendments to the ATCM would extend this requirement to in-use stationary diesel-fueled agricultural engines.

Federal commercial fuel standards are set forth in 40 CFR Part 80 and California fuel standards are set forth in title 13 California Code of Regulations, sections 2281-2285. Fuel suppliers in California must provide diesel fuel that meets both federal and California fuel standards, whichever is more stringent. Since CARB Diesel and verified alternative diesel fuels are the only diesel fuels available in California, ARB staff believe that most, if not all, owners and operators of in-use stationary diesel agricultural engines already use compliant fuel.

5. San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Rule 4702

In June 2005, SJVUAPCD revised District Rule 4702, Internal Combustion Engines - Phase 2, to address District ozone and PM attainment strategies and Senate Bill 700 (Stats. 2003, Ch. 479). Among other provisions in Rule 4702, the District extended NOx, CO, and volatile organic compound (VOC) emission standards to greater than 50 brake horsepower (bhp) compression-ignited internal combustion engines used in agriculture. Except for engines greater than 500 bhp and operating 1,000 or more hours per year, these emission performance standards are scheduled to be phased in beginning in 2010 and are aligned with Tier 3 or Tier 4 new nonroad mobile engine certification standards. Noncertified engines greater than 500 bhp and operating 1,000 or more hours per year are required not to exceed 80 parts per million (ppm) NOx, 2,000 ppm CO, and 750 ppm VOC by January 1, 2008. However, the compliance deadline may be extended to January 1, 2010, if the owner agrees to replace such an engine with an electric motor.

The SJVUAPCD currently permits engines at agricultural operations that emit 50 percent or more of major source air pollutant thresholds. In order to implement and enforce Rule 4702 emission limits for internal combustion engines located at nonmajor agricultural operations, Rule 4702 requires that owners register these engines in the District's Permit-Exempt Equipment Registration Program to be set forth in District Rule 2250.

Although SJVUAPCD Rule 4702 does not specifically regulate diesel PM, it should result in the replacement of older in-use stationary diesel agricultural engines with electric motors or new, cleaner diesel or other engines, just as the proposed amendments to the ATCM will do. In some cases SJVUAPCD Rule 4702 provisions are more stringent with respect to standards or compliance dates. (SJVUAPCD, 2006)

6. South Coast Air Quality Management District (SCAQMD) Rule 1110.2

Effective June 2005, SCAQMD revised District Rule 1110.2, Emissions From Gaseous- and Liquid-Fueled Engines, to extend NOx, CO, and VOC emission standards to greater than 50 bhp gaseous- and liquid-fueled agricultural engines. The owner or operator of an existing stationary agricultural engine may replace the engine with an electric motor or otherwise comply with the Rule 1110.2 emission limits in Table II-1.

Table II-1. SCAQMD Rule 1110.2 Stationary Agricultural Engine Emission Limits

NOx (ppm)[1]	CO (ppm)[1]	VOC (ppm)[1,2]
36	2000	250

1. Corrected to 15 percent oxygen on a dry basis and averaged over 15 minutes.
2. Measured as carbon.

Depending on engine age and emissions at the agricultural operation, compliance with the SCAQMD Rule 1110.12 standards in Table II-1 is required in the 2008-2010 timeframe.

Similar to SJVUAPCD Rule 4702, SCAQMD Rule 1110.2 does not specifically regulate PM emissions, but should result in diesel PM and other pollutant reductions. SCAQMD Rule 1110.2 provisions are more stringent with respect to non-PM pollutant standards and compliance dates. Fewer than 20 greater than 50 bhp in-use stationary diesel agricultural irrigation pump engines are located in the SCAQMD. (SCAQMD, 2005)

7. Incentive and Other Programs for In-Use Stationary Diesel Agricultural Engine Replacement and Retrofit

Incentive programs could play an important role in providing early emissions reductions by encouraging growers to voluntarily replace existing noncertified and Tier 1- and Tier 2-certified stationary diesel agricultural engines with electric motors or new, cleaner Tier 3- or Tier 4-certified engines well before the compliance deadlines of the proposed amendments to the ATCM. Assistance programs, such as the Agricultural Assistance Program are expected to encourage compliance with the proposed amendments and may also be used to help comply with SJVUAPCD and SCAQMD rules. The most significant programs are briefly described below.

a. Utility Incentive Programs for Converting Stationary Agricultural Engines to Electric Motors

Two utility incentive programs (Pacific Gas and Electric's Agricultural Internal Combustion Engine or AG-ICE Conversion Incentive Program and Southern California Edison's Time-of-Use Pumping Agricultural Internal Combustion Engine or TOU-PA-ICE Program) provide reduced electricity rates and electrical line and service extension allowances for growers who voluntarily replace stationary diesel agricultural irrigation pump engines with electric motors. These utility incentive programs are designed to work in conjunction with ARB's Carl Moyer Program and other programs that provide funding toward the purchase of electric motors. Replaced engines must be destroyed unless there are special circumstances approved by ARB or the local air district overseeing incentive funding.

Under the utility incentive programs, eligible growers may submit applications for reduced electrical rates from August 1, 2005, through July 31, 2007, or, until electric line extension funding is no longer available, whichever is earlier. The programs provide up

to 10 years of rates significantly below standard agricultural electric rates (i.e., a 20 percent initial rate reduction for participants in the Pacific Gas and Electric service areas and a 12.5 percent initial rate reduction for participants in the Southern California Edison service area). The total average electrical rate is subject to increases of 1.5 percent each year through 2015.

Predictable agricultural electric rates are expected to promote switching from diesel- to electric-powered irrigation pumps. In addition, the incentive agricultural electric rates have been designed to encourage irrigation during off-peak hours to minimize impacts to the State's electric load (PUC, 2005). More than 1,200 AG-ICE Conversion Incentive Program applications were submitted during the first nine months of the program (Thesen, 2006). Further information about the AG-ICE Conversion Incentive Program is available at http://www.pge.com/agice. Further information about the TOU-PA-ICE Program is available at http://www.sce.com/rebatesandsavings/largebusiness/agricultural/tou-pa-ice.htm.

b. Environmental Quality Incentives Program

The Environmental Quality Incentives Program (EQIP) is a federally-funded program administered by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). Established in 1998, this voluntary program has been designed to provide technical and financial assistance to farmers and ranchers who must comply with local, state, and federal environmental regulations. Under EQIP, state NRCS offices are allocated funds to distribute for the promotion of nationally-prioritized conservation practices at local levels. A farm or ranch owner must apply to the state NRCS office in order to participate in the program. Application approval results in a contract obligating EQIP funds to the participant's project. This process enables the federal government to provide up to 50 percent of the cost of engine replacement to farmers and ranchers located in severe or extreme federal non-attainment areas for ozone. Through 2004, EQIP has provided approximately 3.4 million dollars to San Joaquin Valley farmers and ranchers for engine replacement in order to reduce NOx emissions. Further information about EQIP is available at http://www.nrcs.usda.gov/programs/farmbill/2002/ and http://www.ca.nrcs.usda.gov/programs/equip/. (NRCS, 2003; NRCS, 2005)

c. Carl Moyer Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) provides incentive funds for voluntary projects that reduce NOx, particulate matter 10 microns or less in diameter (PM10), and reactive organic gas (ROG) emissions. Program grants fund the incremental cost of replacing older engines and equipment with electric motors or cleaner-than-required new engines and equipment at a reduced cost to the owner. Projects involving engine retrofits with add-on emission control technology are also eligible for grants.

ARB is responsible for developing and updating Carl Moyer Program guidelines and local air district fund allocation. The local air districts are responsible for ensuring matching funds, project selection, fund disbursement, monitoring, and enforcement. ARB's Carl Moyer Program Guidelines require potential participants to submit project applications to the local air districts. These applications are evaluated for eligibility on the basis of cost-effectiveness. Funds are granted solely to projects which will result in surplus emission reductions (i.e., emission reductions must occur before any applicable regulatory compliance dates have taken effect).

In its initial four years, the Carl Moyer Program has provided nearly 25 million dollars for the replacement of agricultural engines. Table II-2 shows the estimated agricultural engine replacement and PM10 and NOx emission reductions attributed to the Carl Moyer Program through fiscal year 2002-2003. Further information about the Carl Moyer Program is available at http://www.arb.ca.gov/msprog/moyer/guidelines/current.htm. (ARB, 2006a)

Table II-2. Carl Moyer Program Diesel Agricultural Engine Emission Reductions Through Fiscal Year 2002-2003

Irrigation Pump Engines		Tons Per Year PM 10 Reduced	Tons Per Year NOx Reduced
Diesel to Natural Gas	Diesel to Cleaner Diesel		
56	2,150	92	1,911

d. Agricultural Assistance Program

Among other provisions, Assembly Bill 923 (Firebaugh, 2004) established a voluntary Agricultural Assistance Program which authorizes local air districts to increase their motor vehicle fee surcharges in order to fund compliance with emission reduction requirements for previously unregulated agricultural sources of air pollution. Previously unregulated agricultural sources are sources that were unregulated as of January 2005, but subject to regulation at the time an Agricultural Assistance Program grant is made. Unlike the Carl Moyer Program, the Agricultural Assistance Program does not require the emission reductions to be surplus. This means that projects are eligible for funding if emission reductions are achieved within three years of applicable rule adoption, or by the compliance date of an applicable rule, whichever is later. Further information about the Agricultural Assistance Program is available at http://www.arb.ca.gov/msprog/moyer/guidelines/current.htm. (ARB, 2006a)

C. Public Outreach

The public became aware of the ARB's intention to promulgate control measures for diesel engines, including stationary diesel agricultural engines, through the development and publication of the Diesel Risk Reduction Program in 2000. In February 2004, during the public hearing to adopt the original ATCM for Stationary Compression Ignition Engines, the Board specifically directed ARB staff to investigate in-use stationary diesel agricultural engine emission reduction requirements. Therefore, ARB staff conducted public outreach to ensure that affected and interested parties had the opportunity to participate in the development and review of the proposed amendments to the ATCM.

From October 2004 through September 2006, ARB staff met with various groups to discuss regulatory concepts, emission inventory issues, potential health risk, economic impacts, and other aspects of the proposed amendments. Those groups included California Air Pollution Control Officers Association (CAPCOA) committees such as the Toxics and Risk Managers Committee and the Enforcement Managers Committee. Discussions were also held with the Diesel PM Agricultural Working Group and various agricultural industry representatives. ARB staff outreach efforts also included agricultural site-visits and numerous telephone calls and electronic mail with representatives from agricultural stakeholders. Additionally, ARB staff sent notices of public meetings to the agriculture commissioners of every county in California.

In February 2005, ARB staff established a website dedicated to the in-use stationary diesel agricultural engine amendments (http://www.arb.ca.gov/diesel/ag/inuseag.htm). An electronic listserve (to join the listserve, one may access the website or http://www.arb.ca.gov/listserv/listserv.php) has been used on an ongoing basis to notify interested parties about the availability of fact sheets, draft regulatory proposals, information about the regulatory process, and public meeting notices and presentations. The listserve has grown to more than 1,500 individuals and organizations representing affected industries, environmental and citizen groups, and the public. In addition, approximately 3,900 contact persons identified by local air districts received notices of ARB public meetings by regular mail. A summary of participating stakeholders is given in Table II-3. Tables II-4, II-5, and II-6 highlight public outreach events from October 2004 through September 2006.

Table II-3. Participating Stakeholders

Type of Company/Organization	Name of Company/Organization
Agricultural association/group	Agricultural Energy Consumers Organization California Citrus Growers California Cotton Growers and Ginners Association California Farm Bureau Federation Nisei Farmers League
Engine control system manufacturers	Engine Manufacturers Association Caterpillar Inc. Cummins John Deere
Engine distributors and dealers	Cummins West, Inc. Quinn Power Systems Western Power Products, Inc.
Environmental Groups	Coalition for Clean Air Earth Justice Environment California Environmental Defense Environmental Health Counsel Green Environment Natural Resources Defense Council Sierra Club
Fuel delivery and public utilities companies	Cleaire Advanced Emission Controls Pacific Gas & Electric (PG&E) Southern California Edison (SCE)
Government Agencies	California Energy Commission, California Department of Food and Agriculture California Department of General Services County Agricultural Commissioners of Weights and Measures California's Local air districts Public Utilities Commission United States Department of Agriculture United States Environmental Protection Agency
Others	University of California , Davis University of California, Fresno California Air Pollution Control Officers Association State and Territorial Air Pollution Program Administrators and the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO)

Table II-4. Summary of Public Outreach Highlights - 2004

Date	Event	Affected and/or Interested Parties Participating or Contacted
February 26	Board Hearing for ATCM for Stationary Compression Ignition Engine ATCM	Industry and public entities using stationary diesel engines, districts, engine manufacturers, general public
March 4 June 17 September 8 (Modesto)	Agriculture Advisory Committee for Air Quality Meeting	Approximately 30 representatives of agricultural organizations (cattle, dairy, growers, farm bureaus), districts; USDA, U.S. EPA, CDFA, DPR
April 27 June 15	Agricultural Energy Subcommittee of the Agricultural Advisory Committee for Air Quality Teleconference	Approximately 10-15 representatives of agricultural organizations; districts; U.S. EPA
October 19, 2004, (Fresno)	Diesel PM Agricultural Working Group	Representatives from AECA, Madera and Fresno County Farm Bureaus, Merced County Agricultural Commission, California Citrus Growers, California Cotton Ginners and California Cotton Growers Association, Fresno Equipment Company, California Farm Bureau Federation, California Grape and Tree Fruit League, Nisei Farmers League, several agribusiness farms, ranches and companies, CAPCOA and several air districts

Table II-5. Summary of Public Outreach Highlights - 2005

Date	Event	Affected and/or Interested Parties Participating or Contacted
January 12 (Modesto) October 6 (Modesto)	Diesel PM Agricultural Working Group	Representatives from AECA, Madera and Fresno County Farm Bureaus, Merced County Agricultural Commission, California Citrus Growers, California Cotton Ginners and California Cotton Growers Association, Fresno Equipment Company, California Farm Bureau Federation, California Grape and Tree Fruit League, Nisei Farmers League, several agribusiness farms, ranches and companies, CAPCOA and several air districts
March 17 May 26	Board Meeting for Emergency Amendments and Board Hearing for Amendments to the ATCM for Stationary Compression Ignition Engines	Industry and public entities using stationary diesel engines, districts, engine manufacturers, general public
October 19-20 (Selma, Bakersfield, Riverdale, Firebaugh)	Agricultural site visits	Western Power Products, Quinn Power Systems, Borba Farms, Pikalok Farming, California Cotton Ginners and California Cotton Growers Association

Table II-6. Summary of Public Outreach Highlights - 2006

Date	Event	Affected and/or Interested Parties Participating or Contacted
February 14-15 (Tulare)	Agricultural Expo	Public event - describe briefly
March 29	Agricultural Day at the State Capitol	Public event - fact sheet regarding proposed ATCM handed out
April 26 (Modesto) April 27 (Sacramento) July 26 (Colusa, Durham) July 27 (Sacramento) September 20 (Sacramento)	Public Workshops/Meetings	Approximately 20 representatives from local air districts, California Farm Bureau Federation, California Cotton Ginners & Growers Association, Engine Manufacturing Association, Quinn Caterpillar, Western Power Inc., PM control device vendors, UC Davis, Contra Costa County Ag. Commissioner Office, USDA Natural Resources Conservation Service Approximately 50 area farmers attended Colusa/Durham meetings.

III. EMISSION INVENTORY, EXPOSURE, AND HEALTH RISK ASSESSMENT

This chapter provides an overview of stationary diesel agricultural engine operation in California and more detailed information regarding the State's in-use stationary diesel agricultural irrigation pump engine emission inventory, exposure, and potential health risk.

A. Emission Inventory

The Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM) defines engines used in agricultural operations (i.e., also referred to as "agricultural engines") as engines used to grow and harvest crops or raise fowl or other animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. Engines used after harvesting or slaughter for the distribution or processing of agricultural commodities are not considered agricultural engines. The local air districts who will be implementing and enforcing the proposed amendments to the ATCM have years of experience in distinguishing between agricultural and distribution/processing activities.

In California, stationary diesel agricultural engines are primarily used to pump water for the irrigation of crops. They are also used to power agricultural wind machines for the protection of crops during cold weather and may be used in harvesting activities or as back up for electric generation. Agricultural engines are generally operated on a seasonal basis in rural locations in contrast to most nonagricultural engines that are operated year-round in or near heavily-populated areas. The proposed amendments to the ATCM will affect greater than 50 brake horsepower (bhp) in-use stationary diesel agricultural engines with the exception of wind machines, emergency standby generator sets, and certain remotely-located engines (see Chapter IV of this Staff Report).

1. Stationary Diesel-Fueled Agricultural Irrigation Pump Engines

a. Emission Inventory Development

Based on 2002 agricultural census and 2003 survey data, the United States Department of Agriculture National Agricultural Statistics Service estimates that more than 83,000 electric- or fuel-powered agricultural irrigation pumps were operated in California in 2003. Of these pumps, approximately 82 percent were powered by electricity, 15 percent by diesel fuel, and 3 percent by natural gas, liquefied petroleum gas, propane, butane, or gasoline. (USDA, 2002b)

To develop an estimate of the emissions from stationary diesel-fueled pump engines used in agricultural applications, ARB staff developed a methodology that incorporated information from the federal government, other California government agencies, local air districts, and other studies conducted in conjunction with the affected parties. The contributing agencies and organizations are listed in Table III-I. Based on available information, staff believes the methodologies have resulted in a reasonable estimate of

stationary agricultural diesel pump engine emissions. Details and references for the methodology are presented in Appendix D.

Table III-I. List of Contributors to Methodology

Category of Contributor	Contributors Name
Government	California Department of Water Resources ARB Carl Moyer Program U.S. Department of Agriculture Farm and Ranch Irrigation Survey (FRIS) San Joaquin Valley Unified APCD Sacramento Metropolitan AQMD South Coast AQMD U.S. Geological Survey
Engine manufacturers	DDC, Caterpillar, Cummins, and Deutz
Equipment manufacturers	Stewart & Stevenson Valley Diesel
Others	Booz-Allen & Hamilton

b. General Operation of Diesel-Fueled Agricultural Pump Engines

An agricultural diesel-fueled engine is primarily used in two pumping applications. The first application is pumping water from a well directly through an irrigation system to crops or into a canal for later distribution to crops. The second "booster pump" application is pumping surface water from tail water pits or from canals, lakes, or ponds directly to crops or in association with well pump outlet in order to pressurize a sprinkler system. The degree to which each of these two pumping applications occurs depends on the type of crop being irrigated, the weather, and the availability of surface water. For this reason, hours of water pumping vary and may range from less than 100 to several thousand hours per year.

The engines driving the pumps are usually operating at a fixed output (constant load) which requires a constant horsepower from the engines. The constant horsepower of the engine is expressed as a percentage of its maximum capability (also known as the engine's load factor). Because of seasonal variations, such as a lower water table or a loss of pump operating efficiency, engines used in irrigation are often operated at higher horsepower than the pump's optimal design efficiency. Also, wear and tear on the pump may lower its efficiency and water output and require that the engine be operated at a higher load factor than originally designed. Therefore, some growers use engines that are larger than the pump requires in order to start with a lower load factor and increase the engine output (and load factor) as needed. For emission inventory purposes, staff adjusted for such operation by using an average load factor that accounted for the way the engines were being used. The adjusted load factor (65 percent) was obtained after numerous discussions with engines suppliers and studies of affected parties' operations.

c. Stationary Diesel-Fueled Agricultural Pump Engine Population

The 2003 U.S. Department of Agriculture Farm and Ranch Irrigation Survey (FRIS) estimates approximately 12,500 stationary and portable diesel-powered agricultural irrigation pump engines in California. Staff assumed that the diesel-fueled engines were used in the two pumping applications described earlier. Assuming that the distribution of these pump engines are the same as the relative percent in the general pump population, the majority of pump engines are expected to power water pumping from wells into canals or directly to crops (year 2003).

Using 2003 as the baseline year, staff forecast about 8,600 greater than 50 horsepower stationary diesel agricultural pump engines for year 2005. Table III-2 and Table III-3 show the age and size distribution of these engines. Table III-2 indicates that a large number are older more heavily polluting engines. More than half (about 5,000) of the 8,600 engines are expected to be located in the San Joaquin Valley Unified Air Pollution Control District. Table III-3 indicates that most of the engines are medium- to large-sized (i.e., 100 to 750 horsepower range).

Table III-2. 2005 Statewide Distribution of Greater than 50 bhp Stationary Diesel Agricultural Pump Engines (by Tier)[1]

Engine Emission Level	Number of Total Engines	Percent of Total Engines	PM Emissions (ton/day)	NOx Emissions (ton/day)
Tier 0 (Pre-1996)	3,600	42	0.7	14
Tier 1 (1996-2005)	3,500	40	0.6	13
Tier 2 (2001-2010)	1,500	18	0.3	6

1. All values have been rounded.

Table III-3. 2005 Statewide Distribution of Greater than 50 bhp Stationary Diesel Agricultural Pump Engines by Size Category[1,2]

Horsepower Range	Percent of Statewide Engines	Total Engines
>50 to 74	4	340
75 to 99	4	340
100 to 174	48	4,130
175 to 750	44	3,800
>750	<1	2

1. All values have been rounded.
2. Baseline year 2003 engine population forecasted to 2005.

d. Estimated PM Emissions from Stationary Diesel-Fueled Agricultural Pump Engines

Emissions are estimated by multiplying the number of engines by their horsepower rating, load factor, annual operating hours, and emission factor. The basic equation for calculating the emissions of agricultural irrigation pump engines is:

$$E_y = \Sigma\, Pop * EF * Hrs * HP * \%Load$$

where

E = *pollutant specific emissions (tons per year of NOx, HC, CO_2, and diesel PM)*
y = *inventory year*
Pop = *population of diesel agricultural irrigation pumps*
EF = *emission factor (units of g/bhp-hr)*
Hrs = *average annual use in hours*
HP = *average brake horsepower of engine*
%Load = *average engine load factor*

To estimate the total emissions, staff developed a method to group pump engines by horsepower and age. Where available, local district Carl Moyer Program data were used to define engine horsepower at wells, otherwise, the minimum horsepower required to move water for irrigation was calculated. Well locations were determined with GIS software and data from the United States Geological Service, and California Department of Water Resources. This information was used to create county-specific profiles. An emission factor based on the age of the engine was applied to each engine. An adjusted load factor of 65 percent was used to account for the way engines

were being operated at the pumps. An average annual operating time of 1,000 hours based on USDA FRIS, Pacific Gas and Electric (PG&E) agricultural electrical use, local air district and other data were also used to estimate total emissions.

Based on discussions with the public, the net loss of agricultural land Statewide over the past several years, and incentive programs, staff understands that some engines have been removed from service or converted to electric motors. This information (to the extent it could be verified and quantified) is reflected in the uncontrolled emissions forecast for years 2005, 2012, and 2022 shown in Table III-4. Chapter V discusses the controlled emissions forecasted assuming adoption of the proposed amendments to the ATCM.

Table III-4. Projected Statewide Diesel PM and NOx Emissions[1,2]

Year	Uncontrolled PM Emissions TPD (TPY)[3]	Uncontrolled NOx Emissions TPD (TPY)[3]
2005	1.6 (570)	33 (12,000)
2012	1.3 (464)	27 (10,000)
2022	0.8 (303)	19 (6,900)

1. For in-use stationary diesel agricultural engines.
2. All values have been rounded.
3. Baseline year 2003 emissions forecasted to 2005.

2. Stationary Diesel Agricultural Wind Machines

a. General Operation of Agricultural Wind Machines

An agricultural wind machine is an electric motor- or engine-powered fan used exclusively to provide protection to crops during cold weather by mixing warmer atmospheric air with the colder air surrounding a crop. Citrus crops (e.g., oranges, grapefruit, and lemons) are the primary cold-sensitive crops grown in California (Table III-5 shows the State's major citrus-growing areas). Extremely cold temperatures may also damage grapes, avocadoes, and almond trees during the blossom stage. Agricultural wind machines are not located everywhere cold-sensitive crops are grown because localized weather conditions may not require protective measures or because alternative means of averting cold weather damage are used (e.g., pressurized micro-sprinklers).

Table III-5. Major Citrus-Growing Areas In California 2002

County	2002 Citrus Acres
Tulare	110,523
Kern	54,348
Ventura	39,719
Fresno	35,407
Riverside	31,942
San Diego	16,216
Imperial	4,888
San Bernardino	4,864
Madera	4,654

Source: USDA, 2002a

According to agricultural equipment dealers and agricultural industry representatives, agricultural wind machine operation is expensive and labor-intensive. Consequently, an agricultural wind machine is typically operated only when below-freezing temperatures are predicted for two or more consecutive days. In mild winters, agricultural wind machines may not be used at all. In winters with extreme freezing temperatures, agricultural wind machines may be operated up to 80 hours per year. Typical operation is about 45 hours per year and takes place primarily in November and December.

b. Stationary Diesel-Fueled Agricultural Wind Machine Engine Population

Based on information from agricultural equipment dealers, California university agricultural programs, and agricultural industry representatives, ARB staff estimates that approximately 15,000 to 18,000 agricultural wind machines powered by engines or electric motors ranging from 110 to 180 bhp are located in California (typical size is 125 bhp). Only about 1,500 to 2,700 of these machines are expected to be powered by stationary diesel engines. For economic and other reasons, propane is the predominant fuel used by agricultural wind machines in California. In addition, California growers with older stationary diesel-fueled agricultural wind machine engines tend to replace them with spark-ignited propane-fueled engines. As a result, annual sales of new stationary diesel engines for agricultural wind machine applications have steadily declined and Statewide sales are currently estimated at about 10 per year.

c. Estimated PM Emissions from Stationary Diesel-Fueled Agricultural Wind Machine Engines

Specific information regarding the number, age, size, and operation of stationary diesel-fueled agricultural wind machine engines operating in California is not available. Based on available information and the conservative assumption that all of these engines are noncertified with emission rates of 0.55 g/bhp-hr PM, ARB staff estimate PM emissions of about 5 to 9 tons per year (or, less than one percent of the annual PM emissions estimated from diesel agricultural irrigation pump engines).
(CCM, 2005; Cook, 2005c; Phillips, 2005)

3. Other Stationary Diesel Fueled Agricultural Engines and Agricultural Generator Set Engines

a. Applications

Limited information is available regarding the number and characteristics of non-pump diesel engines involved in agricultural activities. ARB staff expects that many of these engines will not be subject to the proposed in-use stationary diesel agricultural engine emission standards because they are portable and/or less than or equal to 50 bhp.

Non-irrigation, non-wind machine agricultural engines may be used in or close to fields for harvesting purposes (e.g., crushing, screening, or wood waste grinding or chipping). Agricultural generator set engines primarily provide back-up power for agricultural irrigation pumps powered by electric motors. Agricultural generator set engines may also be used to provide back-up or primary power for temperature control and lighting for animal enclosures (e.g., poultry houses) or greenhouses. An agricultural generator set engine used solely in emergency situations would be considered an agricultural emergency standby engine.

B. Exposure and Health Risk Assessment

1. Exposure

The exposure and health risk assessment for in-use stationary diesel agricultural engines focuses on irrigation pump engines because they are the most prevalent and utilized of stationary diesel agricultural engines in California. Exposure to stationary diesel agricultural irrigation pump engine emissions in California varies with location. Although agricultural irrigation is a widespread activity in California, the number and use of stationary diesel agricultural irrigation pump engines depends on the crops, growing conditions, and other variables in different areas of the State.

A few California counties are able to rely almost exclusively on gravity-fed irrigation requiring no pumping. In many counties, a combination of gravity-fed and power-assisted irrigation is common. More electric-powered than diesel-fueled agricultural irrigation pumps tend to be used where electricity is readily accessible and economical. Portable and/or less than 50 bhp stationary diesel agricultural irrigation pump engines tend to be used more in areas with plentiful sources of surface water. The greatest potential for exposure is expected in agriculture-intensive areas, such as the San Joaquin Valley and Sacramento Valley, where well-pumping requires the greatest number and use of greater than 50 bhp stationary diesel agricultural irrigation pump engines.

Exposure is also influenced by the tendency of stationary diesel agricultural irrigation pump engines to be located in rural areas with low populations and to be operated on a seasonal (e.g., March through August), rather than year-round, basis.

Specific diesel PM exposure information for stationary diesel agricultural irrigation pump engines is not directly available. Typical ambient PM concentrations reflect both diesel and non-diesel PM emissions from a variety of mobile and stationary emission sources and there are no analytical tools to distinguish diesel PM emissions from different diesel engine applications. Thus, air dispersion modeling is the best means available to provide an assessment of the potential diesel PM exposure levels and health risk from stationary diesel agricultural irrigation pump engines.

2. Health Risk Assessment

a. Considerations and Assumptions

Health risk assessment is a complex process that requires the analysis of many variables to simulate real-world situations. The following key variables can impact the results of a diesel PM health risk assessment for a stationary diesel agricultural irrigation pump engine:

- Diesel PM emissions of engine - The amount of diesel PM emissions from the engine is a function of the engine's emission factor and total annual hours of operation;
- Meteorological conditions - Meteorological conditions affect the dispersion of diesel PM in the air and can have a large impact on resultant ambient concentrations. Higher diesel PM concentrations are found along the predominant wind direction and under calm wind conditions;
- Distance from the receptor - The proximity of the receptor to the engine also affects the diesel PM concentration at the receptor location. Generally, the diesel PM concentration decreases with increasing distance from the engine;
- Exposure duration - Generally, the longer the time of exposure to the PM emissions (duration) the higher the estimated potential health risk; and
- Inhalation rate of receptor - Generally, the higher the inhalation rate, the higher the estimated potential health risk.

b. Dispersion Modeling and Health Risk Assessment Parameters

ARB staff used the U.S. Environmental Protection Agency (U.S. EPA) Industrial Source Complex – Short Term (ISCST3), air dispersion model to predict annual average ambient diesel PM concentrations as a result of standard stationary diesel-fueled agricultural irrigation pump engine operation.

For the purposes of this modeling exercise, engines were chosen for three size categories: less than or equal to (≤) 120 bhp; greater than (>) 120 bhp and ≤ 175 bhp; and > 175 bhp. To represent engines in each of these size categories, stack and emission parameters for pump engines that operate at 86 bhp, 130 bhp, and 225 bhp were used for dispersion modeling to estimate ambient concentrations due to emissions of pump engines.

Ambient concentrations were estimated at distances between 20 and 1,600 meters (1 mile) from the source of emissions to demonstrate risks from pump engine operation. Fresno meteorological data was used to characterize conditions where agricultural pump engine operations are prevalent. Further information regarding the methodology and assumptions used in this modeling exercise are provided in Appendix E.

For the assessment of health risks, emission exposure was assumed to take place for 50 weeks a year for 70 years. The inhalation rate of 302 liter per kilogram-day (L/kg-day) was chosen according to ARB interim health risk management guidelines (ARB, 2003d) and consistent with the Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Guidance Manual for Preparation of Health Risk Assessments, August 2003 (OEHHA guidelines).

c. Potential Cancer Risk

The estimated potential cancer risk estimate is based on a diesel PM inhalation cancer potency factor of 1.1 kilogram-day per milligram (kg-day/mg) applied to the inhalation dose calculated using estimated annual average ambient diesel PM concentrations from operation of stationary diesel fueled agricultural irrigation pump engines. The estimated maximum potential cancer risk for a 225 bhp engine occurs 60 meters downwind from the engine and the risk decreases as the distance from the engine increases. At 60 meters (196 feet), the potential cancer risk for a 225 bhp at Tier 3 emission rate is about 30 chances in a million. At 1,600 meters (1 mile), potential cancer risk for the same engine is approximately 1 chance in a million. Table III-6 shows potential cancer risks at distances of 20 to 1,600 meters from the engine operating 1,000 hours. Table III-7 shows potential cancer risks for an engine operating 2,000 hours. Figure III-1 also demonstrates the change of potential risk with distance from the emission source operating 1,000 hours. Potential cancer risk estimates for the 86 bhp and 130 bhp sized engines are presented in Appendix E.

Table III-6. Potential Cancer Risk at Various Distances from Diesel-Fueled Pump Engines Operating 1,000 Annual Hours[1,2]

Emission Standards	Distance from Source (meters)												
	20	40	60	80	100	200	400	600	800	1000	1200	1400	1600
Tier 0 (Noncertified)	18	87	102	90	67	31	13	8	6	5	4	3	3
Tier 1	13	64	74	65	49	22	10	6	5	3	3	2	2
Tier 2 and Tier 3	5	24	28	25	19	8	4	2	2	1	1	1	< 1
Tier 4	< 1	2	2	2	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1

1. Fresno meteorological data, 225 bhp engine.
2. Potential cancer risk in chances per million, 70-year exposure duration.

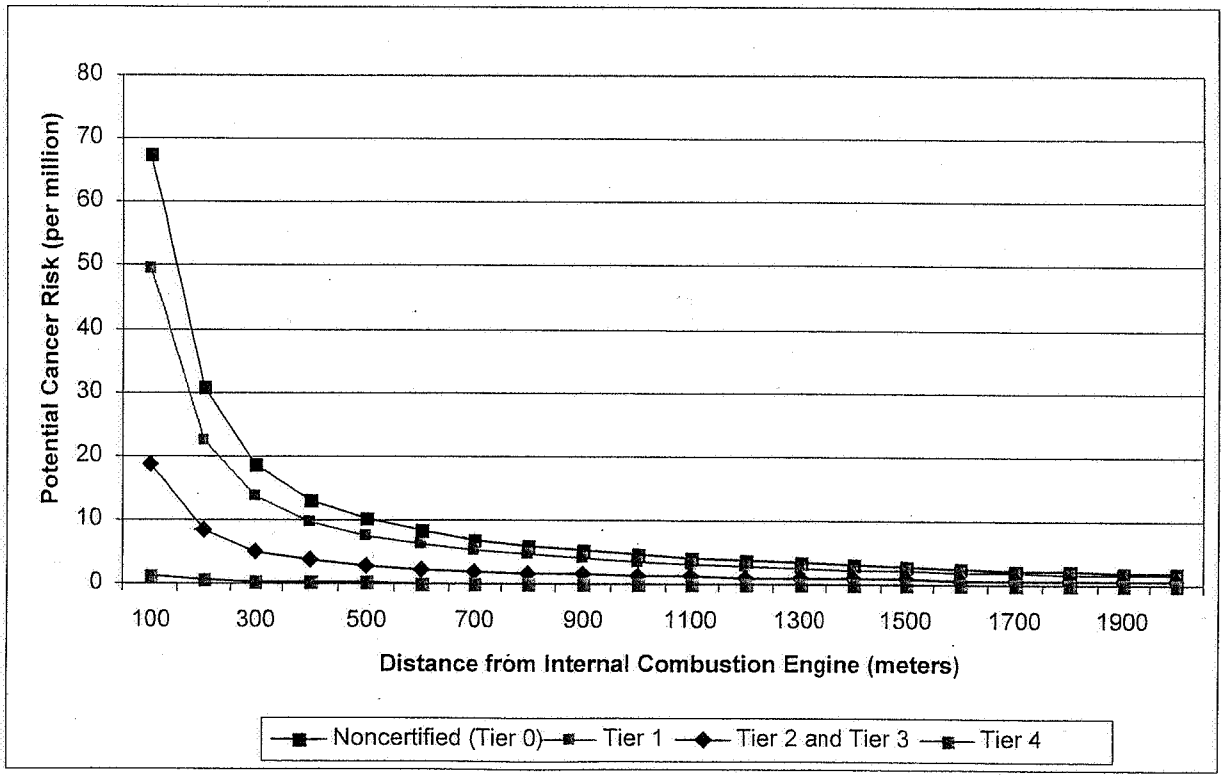
Table III-7. Potential Cancer Risk at Various Distances from Diesel-Fueled Pump Engines Operating 2,000 Annual Hours[1,2]

Emission Standards	Distance from Source (meters)												
	20	40	60	80	100	200	400	600	800	1000	1200	1400	1600
Tier 0 (Noncertified)	32	157	183	162	136	62	27	17	12	10	8	6	5
Tier 1	24	114	133	118	99	45	19	12	9	7	6	4	4
Tier 2 and Tier 3	9	43	50	44	37	17	7	5	3	3	2	2	1
Tier 4	< 1	3	3	3	2	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1

1. Fresno meteorological data, 225 bhp engine.
2. Potential cancer risk in chances per million, 70-year exposure duration.

The potential cancer risk estimates in Table III-6 and Table III-7 reflect potential risk for a possible stationary diesel-fueled agricultural irrigation pump engine. These risk estimates should not be directly applied to any particular engine. Rather, this information is intended to provide an indication of the relative potential levels of cancer risk from these engines. The potential cancer risk estimates in these analyses use conservative assumptions and cancer risks from specific engines are expected to be less than the estimates presented.

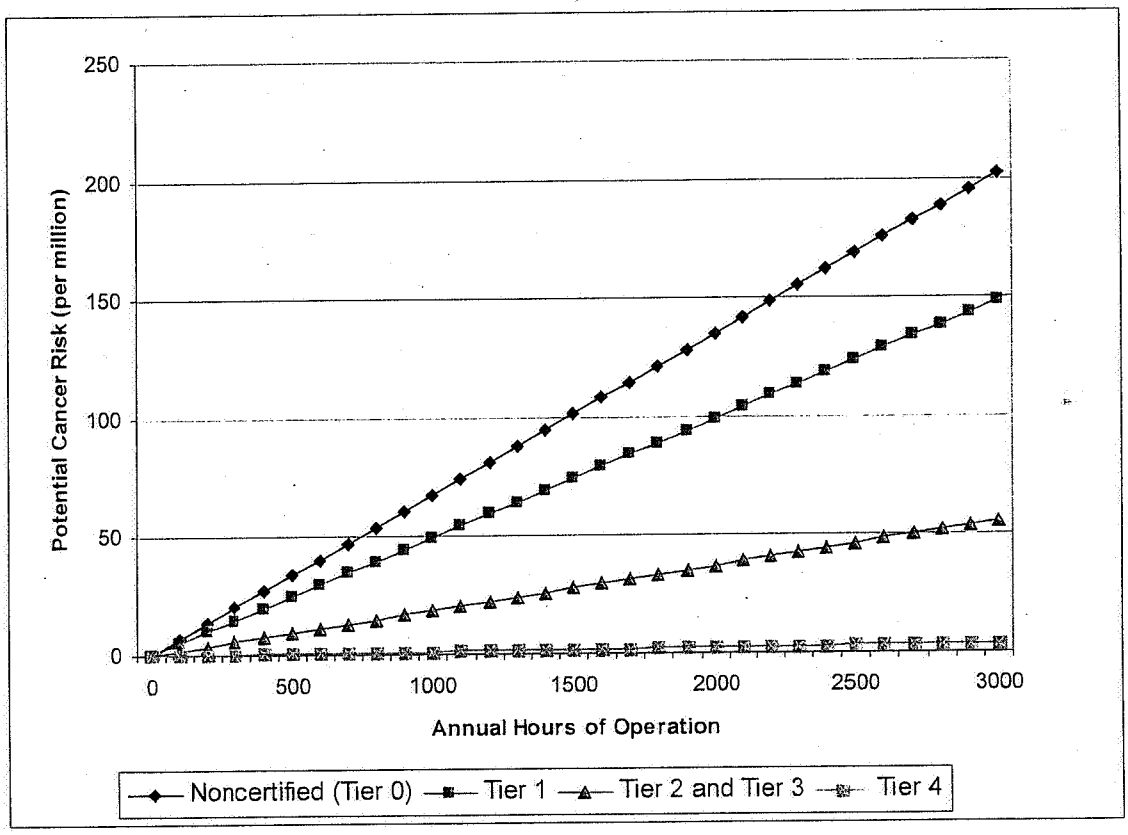
Figure III-1. Potential Cancer Risk in Relation to Distance from Source for Various Diesel PM Emission Standards



Assumptions: Fresno meteorological data, 1,000 annual hours of operation, 225 bhp engine.

In the considerations and assumptions section, we noted that risk is based on the quantity of PM emissions. These emissions and risk will increase with increased annual hours of operation. Figure III-2 demonstrates the increase in potential health risk in relation to increases in annual hours of engine operation.

Figure III-2. Potential Cancer Risk in Relation to Annual Hours of Engine Operation for Various Diesel PM Emission Rates



Assumptions: Fresno meteorological data, 225 bhp engine.

d. Health Effects from Exposure to Diesel PM

Diesel PM and other compounds in diesel exhaust are associated with adverse health effects other than cancer, including: respiratory irritation, bronchitis, aggravation of respiratory and cardiovascular disease, pulmonary inflammation, decreased lung function, and a possible role in exacerbating asthma and respiratory allergic reactions. OEHHA found that exposures to diesel PM resulted in an increase in long-term (chronic) non-cancer health effects. At this time, OEHHA has not quantified short-term (acute) non-cancer health effects. For further information on non-cancer adverse health effects, please see Chapter II of the 2003 Staff Report.

IV. PROPOSED AMENDMENTS AND ALTERNATIVES CONSIDERED

This chapter summarizes the proposed amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM) presented in Appendix A of this Staff Report. This chapter also discusses alternatives considered during the development of the proposed amendments. Additional changes to clarify the ATCM are identified in Appendix B of this Staff Report.

A. Overview

1. In-use Stationary Diesel Agricultural Engine Emission Standards

The primary purpose of the proposed amendments is to establish in-use stationary diesel agricultural engine emission standards in order to reduce diesel particulate matter (diesel PM) emissions, exposure, and health risk. No other federal, State, or district regulation (existing or planned) specifically addresses diesel PM emissions from this source (note: local San Joaquin Valley Unified Air Pollution Control District and South Coast Air Quality Management District rules indirectly affect PM emissions - see Chapter II for a description of these local air district rules).

ARB staff anticipates that most of the in-use stationary diesel agricultural engines affected by the proposed amendments are likely to be used to pump water for the irrigation of crops. The proposed amendments do not apply to diesel-fueled agricultural wind machines. Additionally, agricultural emergency standby generator set engines and remotely-located agricultural engines in federal attainment areas for PM and ozone are exempt from emission limits, provided they are registered with the local air districts and meet monitoring and recordkeeping requirements.

As a result of the proposed amendments, most in-use stationary diesel agricultural engines, greater than 50 horsepower (hp), are expected to meet Tier 3 or Tier 4 off-road compression ignition (CI) engine certification standards by 2022. An overview of the off-road CI engine certification standards is provided in Appendix C of this Staff Report. The proposed amendments include provisions for local air district agricultural engine registration programs and paying registration fees assessed to implement and enforce the ATCM. Additionally, the proposed amendments require owners or operators to fuel their stationary diesel agricultural engines with California Air Resources Board-approved diesel fuel (also known as CARB diesel fuel) or another ATCM-compliant fuel. Section B discusses the emission standard compliance schedule, registration, health risk screening, and fuel requirements in detail.

2. Other Proposed Amendments

In addition to establishing emission standards and other requirements for greater than 50 bhp in-use stationary diesel agricultural engines, staff is proposing to:

- Streamline the fuel reporting requirements for emergency standby engines;

- Update references to the tariff schedule established by the California Public Utilities Commission as it relates to the Rolling Blackout Reduction Program (RBRP);
- Add a new subsection to the definition of "maintenance and testing" that allows local air districts the discretion to not count additional hours of operation necessary to ensure operability of a repaired emergency generator as "maintenance and testing;"
- Harmonize the definition of CARB diesel fuel in the ATCM to be consistent with ARB fuel regulations;
- Provide for new sell-through provisions;
- Add a new compliance option to meet the 0.01 g/bhp-hr diesel PM standard for new and in-use prime and emergency standby engines;
- Clarify the definition of "emergency use" for emergency standby engines at United States Department of Defense facilities performing launch tracking, and provide a schedule to have these engines meet the 0.01 g/bhp-hr diesel PM standard by December 31, 2009;
- Provide local air districts the discretion to exempt certain stationary CI engines used for: testing burners or CI engines; the testing of fuels, fuel additives, or emission control devices at research and development facilities; and training at educational facilities;
- Provide for the use of biodiesel, biodiesel blends, Fischer-Tropsch diesel, and emulsified diesel without verification; and
- Update references.

Appendix B of this Staff Report lists the contents and provides a brief description and rationale of the proposed amendments. In addition, Sections B and C of this chapter provide a more detailed discussion of the most significant changes to the ATCM.

B. Addition of In-Use Stationary Diesel Agricultural Engine Standards and Reporting Requirements

1. Applicability

Section 93115.2(a) Applicability - Agricultural Wind Machines; Section 93115.3(a) Exemptions - Agricultural Emergency Standby and Remotely-Located Agricultural Engines; Section 93115.10(f) Recordkeeping - Exempted Engines

The proposed amendments apply to greater than 50 bhp in-use stationary diesel agricultural engines. Exceptions include stationary diesel agricultural wind machines, emergency standby generator set engines, and remotely-located engines. These engines are not expected to pose a health hazard because of their small numbers, low operating hours, infrequent use, and/or remote locations.

The ATCM does not apply to agricultural wind machines. As described in Chapter III, the stationary diesel engines associated with these machines are not expected to

significantly contribute to diesel PM exposure because of their low annual operating hours and remote locations. In addition, agricultural wind machine emissions are dispersed rapidly due to the machine's fan. In California, most agricultural wind machines are fueled by propane and the relatively small number of diesel-fueled agricultural wind machines is decreasing.

ARB staff is proposing to exempt two types of stationary diesel agricultural engines from in-use emission limits: agricultural generator set engines used solely for emergency standby purposes (e.g., electrical power or natural gas supply failures, floods, and fires) and remotely-located agricultural engines. Due to limited information about the number and operation of these engines, their exempted status is contingent upon the engines being equipped with hour meters and being registered with the local air district. Owner/operators are also required to maintain records of annual hours of operation. Registration and annual operating information would enable future evaluation of these exemptions, if necessary.

Stationary diesel agricultural emergency standby generator set engines are not expected to significantly contribute to diesel PM emission exposure or health risk because they are typically operated on an infrequent basis and in more remote locations than nonagricultural emergency standby engines that are primarily located in densely-populated urban areas (see Chapter III).

Remotely-located agricultural engines must be located more than one-half mile from any receptor and have annual operating hour restrictions (no more than 200 hours per year for Tier 0 and Tier 1 engines; no more than 600 hours per year for Tier 2 and Tier 3 engines). ARB staff expects that engines meeting these criteria will pose a potential cancer risk of less than one chance per million. Also, to be eligible for the exemption, these engines must be located in federal attainment areas for both PM and ozone. This criterion is consistent with ARB and local air district State Implementation Plan (SIP) goals for achieving compliance with federal ambient air quality standards.

If an owner or operator replaces, fails to register, or fails to maintain annual operating hour records for an agricultural emergency standby generator set engine or a remotely-located agricultural engine, he or she must replace the engine with one that does not exceed applicable stationary diesel agricultural engine emission limits within 18 months.

2. Proposed Standards

Section 93115.8(b)

The ATCM's proposed emission performance standards for greater than 50 bhp in-use stationary diesel agricultural engines are summarized in Tables IV-1 and IV-2. These standards are based on the Off-Road CI Engine Certification Standards as described in Chapter II, Section B, of this Staff Report. An overview of the Off-Road CI Engine Certification Standards is provided in Appendix C.

Table IV-1. Proposed Emission Standards for Noncertified Greater than 50 bhp In-Use Stationary Diesel-Fueled Engines Used in Agricultural Operations

Horsepower Range	Application	Compliance On or After December 31	Diesel PM Not to Exceed (g/bhp-hr)	HC, NOx, NMHC+NOx, and CO Not to Exceed (g/bhp-hr)
Greater Than 50 But Less Than 75	Generator Sets	2015	0.02	Off-Road CI Engine Certification Standards for an off-road engine of the same model year and maximum rated power[1]
	All Other Applications	2011	0.30	
Greater Than or Equal to 75 But Less Than 100	Generator Sets	2015	0.01[2]	
	All Other Applications	2011	0.30	
Greater Than or Equal to 100 But Less Than 175	Generator Sets	2015	0.01[2]	
	All Other Applications	2010	0.22	
Greater Than or Equal to 175 But Less Than or Equal to 750	All Applications	2010	0.15	
Greater Than 750	All Applications	2014	0.075	

1. If no limits have been established for an off-road engine of the same model year and maximum rated power, then the in-use stationary diesel-fueled engine used in an agricultural operation shall not exceed Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power irrespective of model year.
2. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

Table IV-2. Proposed Emission Standards for Tier 1- and Tier 2-Certified Greater than 50 bhp In-Use Stationary Diesel-Fueled Engines Used in Agricultural Operations - All Applications

Horsepower Range	Compliance On or After December 31	Diesel PM Not to Exceed (g/bhp-hr)	HC, NOx, NMHC+NOx, and CO Not to Exceed (g/bhp-hr)
Greater Than 50 But Less Than 75	2015 or 12 years after the date of initial installation, whichever is later	0.02	Off-Road CI Engine Certification Standards for an off-road engine of the same model year and maximum rated power[1]
Greater Than or Equal to 75 But Less Than 175	2015 or 12 years after the date of initial installation, whichever is later	0.01[2]	
Greater Than or Equal to 175 But Less Than or Equal to 750	2014 or 12 years after the date of initial installation, whichever is later	0.01[2]	
Greater Than 750	2014 or 12 years after the date of initial installation, whichever is later	0.075	

1. If no limits have been established for an off-road engine of the same model year and maximum rated power, then the in-use stationary diesel-fueled engine used in an agricultural operation shall not exceed Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power irrespective of model year.
2. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

The proposed standards require that noncertified engines (also referred to as "Tier 0" engines) not exceed Tier 3 Off-Road CI Engine Certification Standards for PM by the 2011-2012 timeframe. The proposed standards require that noncertified generator set engines (except emergency standby generator set engines) not exceed Tier 4 Off-Road CI Engine Certification Standards for PM by the 2016 timeframe. Later compliance dates for in-use stationary diesel agricultural generator set engines are reasonable because new engines of this type are already required not to exceed a 0.15 grams per brake horsepower-hour (g/bhp-hr) PM standard that is equivalent to, or more stringent than, the Off-Road CI Engine Certification Standards in effect for the next several years.

The proposed standards also require that Tier 1- or Tier 2-certified engines not exceed Tier 4 Off-Road Certification Standards by the 2015-2016 timeframe, or 12 years after initial installation, whichever is later. Consistent with San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Rule 4702 (Internal Combustion Engines Phase 2), the proposed amendments allow at least 12 operating years for newly purchased and installed engines certified to Tier 1 or Tier 2 emission levels.

The proposed compliance dates for in-use stationary diesel agricultural engines are generally four years after Off-Road CI Engine Certification Standards for new engines become effective. This compliance schedule allows one year to ensure the availability of compliant engine packages for agricultural applications plus the potential for three years early emission reductions as required by the Carl Moyer Program guidelines for incentive funding. Engine availability and Carl Moyer Program incentive funding are discussed in more detail in Sections B.2.b. and B.2.c.

The proposed amendments set forth emission performance standards for pollutants other than PM such as carbon monoxide (CO), hydrocarbons (HC), oxides of nitrogen (NOx), or non-methane hydrocarbons (NMHC)+NOx. These proposed standards require that an in-use stationary diesel agricultural engine not exceed the Off-Road Compression Ignition Engine Certification Standards for an off-road engine of the same model year and maximum rated brake horsepower. If no certification standards have been established for an off-road engine of the same model year and maximum rated brake horsepower, then the affected engine is required not to exceed Tier 1 standards. The proposal would allow owners and operators of Tier 1 and Tier 2 engines to explore add-on PM control technology, rather than replacement, as a compliance option, provided at least Tier 1 emission requirements for non-PM pollutants are met. Compliance options are discussed in more detail in Section B.2.a.

a. Compliance Options

Potential compliance options for meeting the proposed standards include: replacement with an electric motor, replacement with a new CI or another type of nondiesel engine, retrofit with add-on control devices, or alternative fuel use. ARB staff believe that the majority of affected owners and operators will choose to replace their noncertified, Tier 1, or Tier 2 in-use stationary diesel agricultural engines. The major reasons for selecting the engine replacement option include:

- Currently, there is no PM add-on control technology verified for noncertified or "Tier 0" stationary diesel agricultural engines. The relatively small market for California-compliant agricultural engines, coupled with owner concerns regarding engine monitoring, maintenance, and warranty issues, make it unlikely that add-on control devices will be selected as a compliance option for Tier 0 engines;
- Source testing will be needed to demonstrate compliance for retrofitted Tier 1- or Tier 2-certified engine makes and model that are not verified. Engine owners are likely to avoid this option to the cost of testing;
- The proposed amendments allow local air districts to establish more stringent emission limits, earlier compliance dates, and other requirements. Most local air districts are not expected to adopt more stringent PM emission limits, but some may adopt (or already have adopted) more stringent NOx requirements. Often, the only practical means to comply with both the proposed ATCM's PM and district NOx requirements will be engine replacement with an electric motor or new, cleaner diesel engine;
- Because engine replacement maximizes the potential for multiple pollutant emission reductions, it is a more competitive control strategy from an incentive program perspective. Multiple pollutant emission reductions affect cost-effectiveness, the basis for incentive program project evaluations (see Chapter II, Section B); and
- Stationary diesel agricultural engines located close to residential areas, schools, or hospitals may require more stringent emission limits in order to address residual risk. The owners and operators of such engines should consider replacement with electric motors, if feasible.

b. Tier 3 and Tier 4 Diesel Engine Availability

When Off-Road CI Engine Certification Standards transition to more stringent Tier 3 and Tier 4 levels, the effective date for manufacture of the new cleaner engine does not include the six to nine months necessary to develop and manufacture ancillary equipment (e.g., cooling systems, electronic control panels, mufflers) to produce an application-ready engine package. Additional time is usually needed to order, receive, and install a newly-manufactured engine. It is unreasonable to require owners and operators to replace engines before engine packages in the applications they need are widely available. After discussions with engine manufacturers, distributors, and dealers, ARB staff concluded that about one year following the transition to new standards is necessary to ensure that a sufficient number and variety of agricultural pump and other engine packages are available (Cook, 2006a).

To further ensure that compliant new engine packages for agricultural applications are available, ARB staff is proposing to allow the ARB Executive Officer to extend an in-use stationary diesel agricultural emission standard compliance date for up to one year. The Executive Officer's compliance extension must be based on verifiable information that insufficient new engine packages are available to meet the needs of the State's agricultural community.

c. Potential Incentive Funding

Once engine packages become available, current State guidelines generally require at least three years of operation prior to a mandated emission reduction in order to qualify for Carl Moyer Program incentive funding (ARB, 2006a). Allowing for the use of Carl Moyer Program funding should provide a strong incentive for owners and operators to voluntarily replace their engines with electric motors or new cleaner, engines early. This would result in early emission reductions.

Although the Agricultural Assistance Program (see Chapter II, Section B) provides compliance assistance funding without requiring three years of surplus emission reductions, the amount of funds that will be available under this program is unclear. Not all districts are expected to adopt Agricultural Assistance Programs and the amount of funds each district can expect to raise under this program depends on local motor vehicle registration. This creates a disadvantage for a rural district with a low vehicle population but significant numbers of in-use stationary diesel agricultural engines.

d. Provision for Electric Motor Installation

The proposed amendments provide districts with the option of allowing owners or operators up to two additional years to comply, provided they submit documentation that they intend to replace an engine with an electric motor. The time required for utilities to construct line electric extensions and install electric meters can cause unavoidable delays and discourage the electrification option. The additional two years to comply helps to alleviate this potential obstacle to electrification.

e. Compliance Option for Engines Meeting 0.15 b/bhp-hr PM and Equipped With A Verified Control Device

Section 93115.8(b)(6) provides a compliance option for the 0.01 g/bhp-hr PM standard consistent with that available to nonagricultural stationary diesel emergency standby and prime engines meeting 0.15 g/bhp-hr PM and equipped with Level 3 Verified Diesel Emission Control Strategies as explained in Section C.7.

3. Registration Requirements

Section 93115.8(c)

Historically, agricultural engines have not been subject to local air district permitting or registration programs. As a result, most local air districts have limited data on the stationary diesel engines used in agricultural operations. In order to implement the proposed ATCM, there is a minimum set of information about the engine that local air districts will need. To ensure that this information is available, the proposed amendments to the ATCM contain a requirement that all new and in-use greater than 50 bhp stationary diesel agricultural engines be registered with the local air district. Under the registration program, engine owner/operators would be required to submit

registration information for each new and in-use engine to the district which would provide:

- Contact information of the engine owner/operator;
- Make, model, year, and horsepower of the engine;
- The annual hours of operation and fuel usage of the engine;
- The location of the engine; and
- Proximity of the engine to residential areas, schools, and hospitals.

To assist the local air districts, the ARB staff plan to publish guidelines for the agricultural engine registration program. The registration program would provide a tool for district outreach to affected owners or operators as well as a means for compliance tracking and enforcement.

A few agricultural engines located at major operations are already permitted. Alternate programs (for example, a district permitting program) or other district alternatives may be used, provided they are equivalent to the proposed registration program.

4. Residual Risk Provision

Section 93115.8(b)(5)

The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588 or "Hot Spots" Program) was enacted in September 1987. Under the "Hot Spots" program, stationary sources are required to report the types and quantities of certain substances their facilities routinely release into the air. The goals of the program are to collect emission data, to identify facilities having localized impacts, to ascertain health risks, and to notify nearby residents of significant risks. In September 1992, the "Hot Spots" Program was amended by the California State Legislature to address the reduction of significant risks. The amendments require owners of significant-risk facilities to reduce their risks to nearby receptors. The "Hot Spots" program is implemented by the local air districts.

Depending on proximity to receptors, it is possible that some owner/operators who replace their Tier 0 engines with Tier 3 engines in accordance with the proposed amendments may still pose a risk to nearby receptors. Pursuant to the goals of the "Hot Spots" program to address such risk issues, the proposed amendments contain a provision allowing local air districts, on a site-specific basis, to extend compliance with ATCM emission standards provided the engine meets Tier 4 engine Off-Road CI Engine Certification Standards for PM (i.e., 0.02 g/bhp-hr for an engine greater than 50 bhp but less than 75 bhp or 0.01 g/bhp-hr for an engine greater than or equal to 75 bhp) no later than four years after the otherwise applicable ATCM compliance date. Staff does not anticipate residual risk issues from Tier 4 engines because they have very low PM emission rates.

5. Fee Requirements

Section 93115.8(d)

Local air districts are expected to need to assess fees in order to recover the cost of implementation and enforcement activities, including outreach, registration program development and administration, compliance assistance, compliance inspections, and enforcement actions. Adequate funding is critical in order to achieve the stationary diesel agricultural engine emission reductions projected as a result of the proposed amendments. Accordingly, the proposed amendments require that affected owner/operators pay any fees assessed by the local air districts for the purpose of ATCM implementation and enforcement.

6. Fuel-Use Requirements

Section 93115.5(c) - Fuel Use Requirement for In-Use Stationary Diesel Agricultural Engines

The original ATCM and revision to the ATCM (effective December 2004 and September 2005, respectively) exempted in-use stationary diesel agricultural engines from all requirements. The proposed amendments remove this exemption and require that in-use stationary diesel agricultural engines comply with the same fuel use requirements applicable to other stationary diesel-fueled CI engines subject to the ATCM. This means that affected owner/operators would be required to fuel their in-use stationary diesel agricultural engines with one or any combination of the following: CARB Diesel Fuel, an alternative diesel fuel meeting the requirements of the Verification Procedure, an alternative fuel, CARB Diesel Fuel used with fuel additives that meets the requirements of the Verification Procedure.

7. Exemption for Engines Equipped With Selective Catalytic Reduction Systems

Section 93115.3(m) Exemptions - In-Use Stationary Diesel-Fueled CI Engines with Selective Catalytic Reduction Systems

Consistent with the existing ATCM's exemption of in-use stationary diesel emergency standby and prime engines that have selective catalytic reduction (SCR) systems, the ATCM is being amended to extend the exemption to similarly equipped in-use stationary diesel agricultural engines. In general, these engines are exempted because of the high cost and technical issues associated with installing diesel PM control technologies on engines that already have SCR systems in place. Further discussion on the rationale for exempting in-use stationary diesel engines with SCR is provided in Chapter V, Section D, "Staff Report: Initial Statement of Reasons for Proposed Rulemaking - Airborne Toxic Control Measure for Stationary Compression Ignition Engines," September 2003.

8. Definitions

Section 93115.4 - Definitions

Several proposed definitions have been added and one has been revised to clarify the proposed requirements for in-use stationary diesel agricultural engines. Additional definitions to clarify the applicability of the proposed requirements include: agricultural wind machine, certified engine, date of initial installation, noncertified engine, remotely-located agricultural engine, and residential area.

The definition of "New CI Engine" was revised to avoid triggering new stationary diesel agricultural engine emission standards each time a given owner or operator replaces one engine for another on his or her property. Unlike nonagricultural engine applications, the variety and seasonality of crops grown in California mean that a significant number of agricultural engines are moved from one location to another though they are still considered stationary. Also, the "New CI Engine" definition was revised to clarify that new stationary diesel agricultural engines installed after January 1, 2005, are expected to meet in-use stationary diesel agricultural engine emission standards if they are used more than 12 years.

9. Recordkeeping, Reporting, and Monitoring Requirements

Section 93115.10 - Recordkeeping, Reporting, and Monitoring Requirements

For the purposes of public outreach and compliance assurance, owners and operators of in-use stationary diesel agricultural engines will be subject to recordkeeping, reporting, and monitoring requirements. The recordkeeping and reporting requirements are similar to those for other stationary diesel engines in the existing ATCM. These requirements include maintaining records of annual hours of operation, where applicable. Owners and operators of in-use stationary diesel agricultural engines will also be subject to monitoring requirements which include technical specifications for hour meters and diesel particulate filters, where applicable.

Since the majority of information required to reported is collected via the registration program, section 93115.10 has been amended to allow the local air districts to exempt an owner or operator from providing all or part of the recordkeeping and reporting requirements if the information is submitted via a District registration program. The ATCM already provides local air districts the authority to provide an exemption from all or part of the recordkeeping and reporting requirements provided there is a current record of information on the owner or operator's permit to operate, permit application, or other District records.

10. Alternatives Considered

ARB staff considered two alternatives to the proposed in-use stationary diesel agricultural engine emission standards: requiring no standards and requiring that all stationary diesel agricultural engines be replaced with electric motors.

a. No Action

If ARB did not propose these amendments, emissions control for in-use stationary diesel agricultural engines would be left to the local air districts or the federal government. In general, local air districts have the primary responsibility for controlling air pollution from nonvehicular sources. However, Health and Safety Code 39650 through 39675 directs ARB to identify and control toxic air contaminants such as diesel PM. To date, only two districts have regulated in-use stationary diesel agricultural engines, however these regulations are for oxides of nitrogen (NOx) to achieve ozone attainment. It is likely that other districts that are in attainment or moderate non-attainment for ozone will not adopt NOx emission limits at all or will adopt measures that will not address PM emissions. Therefore, the diesel PM emission standards in the proposed amendments to the ATCM are the best means of ensuring diesel PM emissions and exposure reduction from in-use agricultural engines across the State.

b. Require Electrification

From an air quality perspective, electrification of stationary diesel agricultural engines would be highly desirable because it virtually eliminates all emissions. However, cost is a significant obstacle to electrification. Staff found that the annual operating cost of using diesel fuel was between 33 percent (large users) and 70 percent (small users) lower than using electricity based on the 2003 rate schedule. These figures do not include the capital costs for purchasing and installing an electric motor or the cost of obtaining an electric power line extension (if needed) and hook-up.

Staff also found that growers' selection of irrigation pump equipment and preferred power source depends on many variables including irrigation method and schedule, availability of surface water, well pumping depth, quantity of water needed, fuel costs, electricity costs, and electrical infrastructure proximity and adequacy. Staff's evaluation indicated that any decision about the relative desirability or difficulty of converting agricultural irrigation pump diesel engines to electric motors must be made on a site-specific basis.

Electric utility and other incentive programs (see Chapter II, Section B) have overcome some of the cost obstacles by providing a discounted agricultural electric rate schedule or funding for switching from diesel engines to electric motors. However, limited funds are available and not all agricultural operations with in-use stationary diesel engines will qualify or will be able to take advantage of these financial incentives or assistance. Also, the 0.01 g/bhp-hr Tier 4 PM standard would result in 94 percent to 98 percent PM

emission control depending on engine size. This level of emission control is consistent with that achieved by electrification when power plant emissions are considered.

ARB staff believes that the proposed amendments identifying performance standards that can be met by a variety of compliance options including electrification, replacement with new engines, retrofits, alternative technologies, and alternative fuels is the best approach. Electrification is a viable compliance option for farmers, but they need several other options as well to match their site-specific needs. (ARB 2004) However, during development of the proposed amendments, it became clear that more stringent emission limits would be necessary for stationary diesel agricultural engines located near residential areas due to potential residual risk issues. To eliminate potential residual risk, the owners or operators of these engines should consider replacing them with electric motors, if feasible.

C. Other Proposed Amendments

1. Streamline Fuel Reporting and Recordkeeping Requirements for Emergency Standby Engines

Section 93115.10 - Reporting Requirements for Emergency Standby Engines

Several entities have indicated that the fuel reporting requirements for emergency standby CI engines are difficult to meet and place an unnecessary burden on the owner or operator. This is because the refueling practices for emergency standby engines are based upon need, which is different than the refueling practices for prime engines which are typically refueled on a regular schedule. Also, refueling for emergency standby engines often occurs from a centralized location, whereby small quantities of complying fuel are delivered (often via pick-up truck or other small vehicle) from a company corporate yard or fueling station to multiple engines at different locations. Thus, fuel records are often not engine specific. However, the ATCM requires each owner or operator to maintain records that account for all of the fuel used or purchased for use in the engine. An additional concern raised by emergency standby CI engine owners and operators is that the records or logs of fuel deliveries are currently required under the ATCM to be retained on-site. However, many in-use emergency standby CI engines are in remote locations, where it is impractical to maintain fueling records on-site. For these engines, fueling records are typically maintained at a central location that may maintain records for many different engines.

To address these concerns, staff proposes to amend the fuel recordkeeping requirements. First, staff is proposing to allow emergency standby CI engine owners and operators to maintain fuel purchase records demonstrating that the only fuel purchased and supplied to their engine or engines is compliant fuel. These records would be required to be compiled in a monthly summary, and be made available to local air district staff upon request. Also, staff is proposing to allow the retention of these records to be at an off-site central location within California.

2. Amend the Definition of a Rolling Blackout Reduction Program

Section 93115.4(mmm) - Definition of Rolling Blackout Reduction Program

The San Diego Gas and Electric Company (SDG&E) offers an optional interruptible electric service (ISC) to its customers in exchange for discounted electric rates. In return, the customer agrees to reduce its power consumption from the grid during either a Stage 3 electrical alert or a transmission emergency. The Rolling Blackout Reduction Program (RBRP) is the ISC program in San Diego County. The most current rates and special conditions, which are authorized and approved by the California Public Utilities Commission (PUC), are posted on SDG&E website in its "Electric Tariff Book – Miscellaneous Rates".

Since adoption of the ATCM, the PUC has approved a new tariff schedule for the RBRP that contains a new energy reduction payment rate and special conditions. This payment rate and special conditions are not consistent with similar elements in the ATCM's definition of the RBRP. For example, the new tariff schedule for the RBRP contains a new energy reduction capacity (50 kilowatts (kW) instead of 100 kW) and new payment rate ($0.35 instead of $0.20 per kW-hr). The new tariff schedule became effective on May 29, 2005.

Since various elements of the Schedule RBRP are subject to change by the PUC, staff proposes to remove any reference to specific values, percentages, or minimum reductions in capacity in the definition of an RBRP in the ATCM, and instead reference the currently applicable tariff schedule for SDG&E, as approved by the PUC.

3. Clarify the Definition of "Maintenance and Testing"

Section 93115.4(uu) - Definition of Maintenance and Testing

Several facilities have indicated that during routine maintenance they have encountered equipment breakdown or failure of one or more of their emergency standby engines. This has necessitated additional testing after repair of the equipment to ensure its reliability in the event of emergency use. Staff found that some local air districts recognize these additional hours as maintenance and testing, while other local air districts recognize these additional hours as emergency use. Staff proposes to add a new subsection to the definition of "maintenance and testing" that allows local air districts the discretion to not count these additional hours of operation as "maintenance and testing".

4. Changes to the Definition of CARB Diesel Fuel

Section 93115.4(h) – Definition of CARB Diesel Fuel

The current definition of California (CARB) diesel fuel in the ATCM is inconsistent with the current specifications for CARB diesel fuel, as prescribed in Title 13, California Code

of Regulations (CCR), sections 2281 and 2282. Title 13, CCR, sections 2281 and 2282 establish sulfur and aromatic hydrocarbon specifications, respectively, for vehicular diesel fuel sold in California, and provide for diesel fuels that contain less than 50 percent biodiesel to be sold as CARB diesel fuel. In addition to these specifications, the California Department of Food and Agriculture, Division of Measurement Standards (DMS) also enforces minimum diesel fuel quality specifications, as specified in American Society for Testing and Materials (ASTM) D975, for CARB diesel fuel sold through retail outlets in the state. However, these same provisions are not enforced by DMS at non-retail distribution outlets (i.e., diesel fuel storage tanks at farms, government and private corporate yards, etc.). Also, ASTM D975 is not an element in the CARB diesel fuel regulations.

In order to ensure consistency between the CARB diesel fuel regulations and the ATCM, staff is proposing to harmonize the definition of CARB diesel fuel with the CARB diesel fuel regulations. This will also ensure that the ATCM does not place additional requirements on diesel fuel supplied from non-retail diesel fuel outlets to engines covered by the ATCM.

5. Changes to the Definition of Alternative Diesel Fuel

Section 93115.4(e) - Definition of Alternative Diesel Fuel

As previously discussed, the CARB diesel fuel regulations allow for a biodiesel blend less than 50 percent biodiesel (B50) to be sold as CARB diesel fuel so long as the biodiesel blend meets the specifications of Title 13, CCR, sections 2281 and 2282. However, all biodiesel blends are currently defined as "alternative diesel fuel" in the ATCM To alleviate this, staff is proposing to include biodiesel blends less than B50 in the definition of "CARB diesel fuel" Biodiesel blends greater than B50, and any other biodiesel blends which do not meet the definition of "CARB diesel fuel", would continue to be defined as "alternative diesel fuel."

6. Use of Certain Alternative Diesel Fuels

Section 93115.5(c) - Fuel and Additive Requirements for New and In-Use Stationary CI Engines That Have a Rated Brake Horsepower of Greater than 50

Currently, in order to use alternative diesel fuels in engines covered by the ATCM, the fuel must meet the requirements of the Verification procedures. Under the proposed amendments, staff is proposing to remove the requirement that certain alternative diesel fuels first undergo verification prior to their use. Specifically, staff is proposing to allow, without verification, the use of biodiesel, biodiesel blends not meeting the definition of CARB diesel fuel, Fischer-Tropsch fuels, and emulsions of water in diesel fuel.

Staff's proposal is based on both a reevaluation of existing statute relative to fuel specifications, and a recognition that the use of these alternative diesel fuels can provide substantial PM benefits relative to CARB diesel fuel. While the use of some of

these fuels may result in slight increases in some pollutants, such as NOx and hydrocarbon, the new revisions to the Verification Procedures effective in 2006 disallow NOx+HC exceedances greater than 10 percent.

In providing for the use of these fuels, it is also important to note that local air districts maintain permitting authority over these engines, and as part of that authority, may specify allowable fuels which may be used. In addition, many local air districts have also adopted prohibitory rules regulating criteria pollutant emissions from these engines. As such, even with the proposed amendments, local air districts maintain the discretion to allow, limit, or prohibit the use of these fuels in stationary engines operating in their district.

7. Sell-through Provision for Stock Engines

Sections 93115.3(s) and 93115.4(vvv) - Sell-Through Provision for Stock Engines

Revisions to the ATCM made in September 2005 clarified that when new engine standards change, local air districts have some discretion to allow, in specific instances, end users to acquire and install engines which do not meet the most current new engine standards in effect, as specified in the Off-Road CI Certification Emission Standards. For example, in certain circumstances, this provision allows an end user to install a new Tier 2 engine rather than a new Tier 3 engine. Local air districts must base this decision on either the date of engine acquisition or on the date an application was submitted for a district permit.

While provisions for addressing the impacts on end users when new engine standards change was addressed in the September 2005 amendments, this issue was not addressed for new engine distributors and dealers and the owner/operator of the engines. This issue is significant in that new engine distributors and dealers can be left with an inventory of non-compliant, non-salable stock engines when new, more stringent emission standards become effective. Currently, distributors and dealers cannot legally sell these engines in California. Also, they cannot return them to the manufacturer or sell them outside their sale territories. The engines, which can't be sold, represent a potentially significant financial loss to California distributors and dealers.

To address these concerns, staff is proposing a sell-through provision for the sale of never-been-used stock engines. This provision, subject to local air district approval, would allow the limited sale and use of these stock engines in California, which do not meet the current new engine standards, as provided in the Off-Road CI Certification Emission Standards. To sell engines not meeting the current Off-Road CI Certification Emission Standards, dealers and distributors must comply with the following applicable conditions:

- The engines were delivered in California to the seller no more than 12 months immediately preceding the transition to new standards for an off-road CI engine of the same model year and maximum rated power;
- The engine was sold by the seller no later than six months after the effective date of the new standards; and
- The engine must meet the Off-Road CI Engine Certification Standards (title 13, CCR, section 2423) immediately preceding the current certification standards for an off-road CI engine of the same model year and maximum rated power.

Since carrying excessive inventory of new engines on hand is expensive for dealers and distributors, staff does not believe that significant numbers of engines not meeting the current Off-Road CI Certification Emission Standards will be available at the time that more stringent emission standards become effective.

An additional provision has been added which allows owners or operators to use these engines as long as the following conditions are met:

- The date of acquisition of the stock engine is no later than six months from the date an emission standard applicable to new engines becomes more stringent than the emission standard to which the stock engine is certified; and
- The date the District determines the application is complete for an Authority to Construct permit is no later than six months after the date of acquisition of the stock engine.

8. Compliance Demonstration for New and In-Use Emergency and Prime Diesel-Fueled Engines

Tables (1 & 2) Summary of the Emission Standards and Operating Requirements New and In-Use Emergency Standby Diesel-Fueled CI Engines Greater Than or Equal to 50 bhp; and Tables (3 & 4) Summary of the Emission Standards for Prime Diesel-Fueled CI Engines Greater Than 50 bhp

Since the amendments to the ATCM, engine manufacturers, owners, and operators have brought to our attention that source testing to demonstrate initial compliance to the 0.01 g/bhp-hr diesel PM emission standard was becoming commonplace within certain local air districts. However, the intent of the ATCM was to reduce the need for source testing through the installation of CI engines certified to the applicable Off-Road CI Certification Emission Standards, in combination (if necessary) with a Verified Diesel Emission Control Strategy. It was expected that this action would expedite the local air district permitting process and limit the costs associated with source testing.

To clarify staff's intent, we are proposing to add new language specifying that a certified Tier 3 off-road engine (or Tier 2 off-road engine for engines greater than 750 bhp) meeting a 0.15 g/bhp-hr PM emission standard, when equipped with a Level 3 Verified Diesel Emission Control Strategy, will be deemed in compliance with the 0.01 g/bhp-hr diesel PM emission standard in the ATCM, until such time that Tier 4 engine standards

become effective. Staff believes that this change will provide consistency and more certainty to end users throughout the state regarding what technology is acceptable to demonstrate compliance with the 0.01 g/bhp-hr diesel PM emission standard in the ATCM.

9. Pre-launch System Checks and Post Launch Tracking at Vandenberg Air Force Base

Section 93115.3(t) - Allowance for up to 100 Hours of Maintenance and Testing
Section 93115.4(dd) - Definition of Emergency Use

Officials from Vandenberg Air Force Base (VAFB) and the Santa Barbara County Air Pollution Control District met with staff to discuss the definition of emergency use as defined in the ATCM, and specifically how this definition is applied to emergency standby engines operated by VAFB for pre-launch system checks. VAFB staff indicated that they considered all engine operation associated with pre-launch system checks at Command Destruct (CT) sites as emergency hours of operation, no matter how long prior to the actual or anticipated launch the engine operation occurred. ARB staff's intent when developing the ATCM was to only consider the pre-launch system checks that occurred the day of the launch to be considered "emergency use" and any system checks conducted on days prior to day of launch should be considered as "maintenance and testing" hours.

Based on these discussions, ARB staff concluded it is necessary to clarify the definition of "emergency use" in the ATCM. Staff has proposed to clearly indicate that only pre-launch system checks and any post-launch flight tracking at CT sites that occurs in the time period of up to 24-hours surrounding the launch is considered "emergency use". Any other operation of these engines for pre-launch system checks outside of this window will be counted as "maintenance and testing." Because of the uncertainty regarding the status of these engines relative to meeting the appropriate compliance dates and limitations on hours of operation in the ATCM, staff has proposed adding a new limited exemption that provides VAFB until December 31, 2009, to modernize these engines. Staff is also proposing to provide additional maintenance and testing hours to these engines until December 31, 2009, to ensure there are no disruptions in the ability of these engines to perform their required duties.

10. Test Cells, Test Stands, or Stationary Engines Used at Research and Development or Educational Facilities

Section 93115.3(u) - Exemption for Requirements of the ATCM for Stationary Engine Test Cells, Test Stands, or Stationary CI Engines Used at Research and Development Facilities or Used Exclusively for Training at Educational Facilities

Stationary CI engines used at research and development facilities or educational institutions may be operating in violation of the emission standards of the ATCM. Several local air districts have voiced concerns that the purpose and nature of these

operations require that these engines emit at rates that exceed the performance standards of the ATCM. To address this, staff is proposing upon local air district approval, a new exemption from the requirements of the ATCM for engines that are used exclusively: as engine test cells and test stands used for testing burners or CI engines; for operation or performance testing of fuels, fuel additives, or emissions control devices at research and development facilities; or for maintenance, repair, or rebuild training at educational facilities.

11. Amend Reference for In-Use Emergency Fire Pumps

Section 93115.3(n) - Exemption for In-Use Emergency Fire Pumps

The National Fire Protection Association (NFPA) 25, "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems", referenced in the ATCM was revised in 2002, and is scheduled to be updated in 2006. The ATCM currently references the 1998 edition. Staff proposes to amend this section to reference the 2006 edition, and to include additional language that allows the Executive Officer to approve a more current edition as it is updated.

D. Potential Benefits of the Proposed Amendments

The proposed amendments would benefit public health by reducing diesel PM exposure and cancer risk, particularly in areas where stationary diesel agricultural engines operate. The proposed amendments are also expected to result in reductions in emissions of other air pollutants, e.g., NOx and ROG. NOx and ROG are precursors to ozone formation in the lower atmosphere and NOx is a precursor to secondary PM. Decreased ozone formation is likely to reduce illness, emergency room visits, and hospital admissions due to respiratory problems. The proposed amendments would contribute to further progress in meeting ambient air quality standards for PM10, PM 2.5, and ozone. The proposed amendments would benefit the environment by improving visibility and by reducing soiling, crop loss, and damage to ornamental and forest vegetation.

ARB staff believes that the proposed amendments will effectively reduce diesel PM and other air pollutant emissions from in-use stationary diesel agricultural engine because they:

- Complement and are consistent with existing local air district and federal regulations without duplicating them;
- Provide compliance flexibility in recognition of the diverse nature of agriculture in California (though ARB staff expect engine replacement with an electric motor or cleaner diesel or other engine to be the most practical and popular option);
- Have been designed to maximize and facilitate compliance by ensuring the availability of compliant replacement engines;
- Provide potential for early emission reductions by allowing opportunity for affected owner/operators to apply for Carl Moyer Program incentive funding; and

- Provide a means of identifying affecting parties, conducting outreach, and tracking compliance with ATCM emission limits and residual risk requirements for engines located close to residential areas, schools, and hospitals while allowing local air district flexibility to choose the most appropriate implementation and enforcement mechanism for their area.

V. ENVIRONMENTAL IMPACTS

The proposed amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (Stationary Diesel ATCM) are intended to protect the health of California citizens by reducing exposure to emissions from stationary diesel engines used in agriculture. An additional consideration is the impact the proposed amendments may have on the environment. This chapter describes the potential impacts on the environment (i.e., air, land and water) and environmental justice. Based on available information, ARB staff has determined that no significant adverse environmental impacts should occur as a result of adopting the proposed amendments.

A. Legal Requirements

Compliance with the proposed amendments are expected to directly affect air quality and potentially affect other environmental media as well. The California Environmental Quality Act (CEQA) and ARB policy require an analysis to determine the potential environmental impacts of proposed regulations. Because ARB's program involving the adoption of regulations has been certified by the Secretary of Resources pursuant to Public Resources Code section 21080.5, the CEQA environmental analysis requirements may be included in the Initial Statement of Reasons (ISOR) for this rulemaking. In the ISOR, ARB must include a "functionally equivalent" document, rather than adhering to the format described in CEQA of an Initial Study, a Negative Declaration, and an Environmental Impact Report. In addition, staff will respond, in the Final Statement of Reasons for the amendments to the ATCM, to all significant environmental issues raised by the public during the public review period or at the Board public hearing.

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

- An analysis of reasonably foreseeable environmental impacts of the methods of compliance;
- An analysis of reasonably foreseeable feasible mitigation measures (CEQA requires an agency to identify and adopt feasible mitigation measures that would minimize any significant adverse environmental impacts); and
- An analysis of reasonably foreseeable alternative means of compliance with the amendments to the ATCM.

ARB staff's analysis of these requirements is presented below. We have concluded that the proposed amendments are needed to reduce the risk from exposures to diesel exhaust particulate matter (diesel PM), as required by the Health and Safety Code (H&SC) section 39666, and to fulfill the goals of ARB's Diesel Risk Reduction Plan. (ARB, 2002) We have also concluded that implementation of the proposed amendments would have no significant adverse environmental consequences requiring mitigation and that there are no alternative means of compliance with the requirements

of Health and Safety Code section 39666 that would achieve similar diesel PM reductions at a lower cost.

B. Effects On Air Quality

In-use stationary diesel agricultural engines emit diesel particulate matter (PM), oxides of nitrogen (NOx), carbon monoxide (CO), reactive organic gases (ROG), and several other pollutants that have the potential to cause cancer and other health effects. The proposed amendments are expected to directly impact air quality and are designed to reduce exposure to diesel PM emissions from in-use stationary diesel agricultural engines by requiring, according to a specified compliance schedule, that they emit no more than off-road compression ignition (CI) engine certification standards for a new off-road engine of the same size and model year. Provided the proposed emission performance standards are met, compliance may be achieved by retrofits or the use of alternate fuels; however, ARB staff expect replacement with electric motors or cleaner diesel or other engines to be the most practical and popular compliance strategy as explained in Chapter IV of this Staff Report. ARB staff encourage replacement as the best means for achieving maximum emission reductions of diesel PM and other pollutants.

In addition to the proposed amendments, other factors affecting emission reductions include a Statewide negative growth rate for agriculture (see Appendix D), the impact of local air district rules, and electric utility and other incentive programs encouraging older diesel engine replacement (see Chapter II, Section B). Table V-1 and Table V-II show projected daily emissions of diesel PM and NOx from stationary diesel agricultural irrigation pump engines for years 2005, 2012, and 2022. The tables also show emission reduction estimates for years 2012 and 2022 based on the assumption that, from 2005 through 2022, 20 percent of noncertified, Tier 1, and Tier 2 engines will be replaced with electric motors while 80 percent will be replaced with cleaner diesel engines. Staff estimate that diesel PM would be reduced by approximately 0.9 tons per day by 2012 and 1.2 tons per day by 2022. Similarly, NOx would be reduced by approximately 16 tons per day by 2012 and 22 tons per day by 2022.

Staff estimate average Statewide emission reductions from 2005 through 2022 of 171 tons per year of diesel PM and 3,000 tons per year of NOx and cumulative emission reductions of 2,900 tons of diesel PM and 51,000 tons of NOx.

Approximately 50 percent of the projected Statewide emission reductions can be attributed to San Joaquin Valley Air Pollution Control District Rule 4702 whose compliance dates precede those of the proposed amendments to the ATCM. Although South Coast Air Quality Management District Rule 1110.2 compliance dates also precede those of the proposed amendments, it does not have a significant impact on projected Statewide emission reductions due to the relatively small number of affected engines.

Table V-1. Projected Statewide Diesel PM Emissions and Emission Reductions[1,2]

Year	Uncontrolled Emissions TPD (TPY)[3]	Controlled Emissions TPD (TPY)	Emission Reductions From 2005 TPD (TPY)	Percent Emission Reductions (2005-2022)
2005	1.6 (570)	1.6 (570)	0	0
2012	1.3 (460)	0.7 (240)	0.9 (330)	60
2022	0.8 (300)	0.4 (130)	1.2 (440)	80

1. For in-use stationary diesel agricultural pump engines.
2. All values have been rounded.
3. Baseline year 2003 emissions forecasted to 2005.

Table V-2. Projected Statewide NOx Emissions and Emission Reductions[1,2]

Year	Uncontrolled Emissions TPD (TPY)[3]	Controlled Emissions TPD (TPY)	Emission Reductions From 2005 TPD (TPY)	Percent Emission Reductions (2005-2022)
2005	33 (12,000)	33 (12,000)	0	0
2012	27 (10,000)	17 (6,200)	16 (5,800)	50
2022	19 (6,900)	11 (3,900)	22 (8,100)	70

1. For in-use stationary diesel agricultural pump engines.
2. All values have been rounded.
3. Baseline year 2003 emissions forecasted to 2005.

C. Health Benefits of Diesel PM Emission Reductions

As described in Chapter II of Staff Report: Initial Statement of Reasons for Proposed Rulemaking – Airborne Toxic Control Measure for Stationary Compression Ignition Engines, September 2003, diesel PM is one of a complex mixture of potentially harmful inorganic and organic compounds in diesel exhaust. Implementation of the proposed amendments would reduce directly emitted and secondarily formed PM levels, provide both near source and regional risk reduction, and contribute to the overall effort of reducing PM mortality, hospital admissions, and lost work days. Table V-3 identifies the diesel exhaust compounds of major interest and briefly summarizes their effects on human health and the environment.

Additionally, reductions in NOx and ROG from in-use stationary diesel agricultural engines as a result of the proposed amendments would contribute to reducing exposures to ambient ozone. Emissions of NOx and ROG are precursors to the formation of ozone in the lower atmosphere and diesel engine exhaust contributes to ozone precursors. 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.

Table V-3. Major Air Pollutants In Diesel Exhaust

Pollutant	Potential Adverse Health Effect	Potential Adverse Environmental Effect
Diesel Particulate Matter (diesel PM)	cancer, pulmonary inflammation, aggravation of respiratory and cardiovascular disease, adjuvant in allergic responses and possibly asthma	soot, soiling, impaired visibility
Other Toxic Air Contaminants [e.g., arsenic, benzene, formaldehyde, nickel, polycyclic aromatic hydrocarbons (PAHs)]	cancer (acute exposures - reproductive/developmental problems, eye irritation, respiratory irritation, immune response problems)	
Oxides of Nitrogen (NOx)		
ozone precursor in combination with reactive organic gases	respiratory inflammation and irritation, aggravate pre-existing diseases (e.g., asthma), emphysema, bronchitis	forest and ornamental plant damage, crop loss, rubber and plastic damage
PM precursor	pulmonary inflammation, aggravation of respiratory and cardiovascular disease, adjuvant in allergic responses and possibly asthma	soot, soiling, impaired visibility
Reactive Organic Gases (ROG) (also known as Volatile Organic Compounds or VOC)		
ozone precursor in combination with NOx	see oxides of nitrogen	see oxides of nitrogen

Source: ARB, 1985; ARB, 2001b; ARB, 2003b; OEHHA, 1999

D. Reasonably Foreseeable Environmental Impacts as a Result of Potential Compliance Methods

As previously mentioned, ARB staff expect that the most practical and popular means of complying with the proposed standards for in-use stationary diesel agricultural engines will be engine replacement with electric motors or cleaner diesel or other engines. Staff have identified potential adverse environmental impacts from other compliance options such as diesel oxidation catalysts (DOCs) and diesel particulate filters (DPFs) that may be used with new engines or as add-on control devices (i.e., retrofit devices). These impacts include a potential increase in sulfate PM, a potential increase in NO_2 from

some DPFs, and the potential for creating hazardous wastes. As described below, options are available to mitigate these potential adverse impacts.

1. Diesel Oxidation Catalyst

Two potential adverse environmental impacts from the use of DOCs have been identified. First, as is the case with most processes that incorporate catalytic oxidation, the formation of sulfates increases at higher temperatures. Depending on the exhaust temperature and sulfur content of the fuel, the increase in sulfate particles may offset the reductions in soluble organic fraction emissions. Using low-sulfur diesel fuel can minimize this effect. Second, a DOC could be considered a "hazardous waste" at the end of its useful life depending on the materials used in the catalytic coating. Because catalytic converters have been used on gasoline powered on-road vehicles for many years, there is a very well established market for these items (see, for example, http://www.pacific.recycle.net – an Internet posting of buyers and sellers of various scrap materials). In the recycling process, the converters are broken down, and the metal is added to the scrap-metal stream for recycling, while the catalysts (one or a combination of the platinum group metals) are extracted and reused.

Because of platinum's high activity as an oxidation catalyst, it is the predominant platinum group metal used in the production of DOCs. There is a very active market for reclaimed platinum for new catalytic converters, jewelry, fuel cells, cathode ray tube screens, catalysts used during petroleum refining operations, dental alloys, oxygen sensors, platinum electrode spark plugs, medical equipment, platinum-based drugs for cancer treatment, and other uses. (Kendall, 2002; Kendall, 2003).

2. Catalyzed Diesel Particulate Filters

These devices are composed of a ceramic DPF along with a platinum catalyst to accelerate the oxidation of carbon-containing emissions and significantly reduce diesel PM emissions. This is an obvious positive environmental impact. However, there are also inorganic solid particles present in diesel exhaust, which are captured by DPFs. These inorganic materials are metals derived from engine oil, diesel fuel, or engine wear and tear. While the PM filter is capable of capturing inorganic materials, these materials are not oxidized into a gaseous form and expelled. Filters benefit the environment by capturing these metallic particles, known as "ash," which would otherwise be released into the air. However, the ash that is collected in the PM filter must be removed from the filter periodically to maintain the filter's effectiveness.

Ash collected from a diesel engine using a typical lubrication oil and no fuel additives has been analyzed and is primarily composed of oxides of the following elements: calcium, zinc, phosphorus, silicon, sulfur, and iron. Zinc is the element of primary concern because, if present in high enough concentrations, it can make the waste a hazardous waste. Title 22, California Code of Regulations (CCR), section 66261.24 establishes two limits for zinc in a waste: 250 milligrams per liter for the Soluble Threshold Limit Concentration and 5,000 milligrams per kilogram for the Total Threshold

Limit Concentration. The presence of zinc at or above these levels would cause ash to be characterized as a hazardous waste.

Under California law, it is the generator's responsibility to determine if waste is hazardous. Applicable hazardous waste laws are found in the H&SC, division 20; title 22, CCR, division 4.5; and title 40 of the Code of Federal Regulations. Staff recommends owners that install a DPF on an engine to contact both the manufacturer of the diesel emission control system and the California Department of Toxic Substances Control (DTSC) for advice on proper waste management.
ARB staff consulted with personnel of DTSC regarding management of the ash from DPFs. DTSC staff advised ARB that it has a list of facilities that accept waste from businesses that qualify as a conditionally exempt small quantity generator. Such a business can dispose of a specific quantify of hazardous waste at certain Household Hazardous Waste events, usually for a small fee. Specific information regarding the identification of and acceptable disposal methods for wastes is available from DTSC (http://www.dtsc.ca.gov)

High-pressure water and detergent are sometimes used to remove ash from DPFs. However, this practice would generate wastewater containing metal oxides, and possibly be considered hazardous waste, that can not be discharged to the sanitary sewer or storm drains. Technology is currently available for reclamation of zinc from waste. For example, the Swedish company MEAB has developed processes for extracting zinc and cadmium from various effluents and industrial waste streams. Whether reclamation for reuse will be economically beneficial remains to be seen. (MEAB, 2003). Some DPF cleaning techniques can cause ash to be illegally released directly into the air/or work environment potentially exposing the public and/or workers to zinc and other metal oxides.

Because of the time and costs associated with filter maintenance, there are also efforts by industry to reduce the amount of ash formed. Most of the ash is formed from the inorganic materials in engine oil, particularly from zinc-containing additives necessary to control acidification of engine oil – due in part to sulfuric acid derived from sulfur in diesel fuel. As the sulfur content of diesel fuel is decreased, the need for acid neutralizing additives in engine oil should also decrease. A number of technical programs are ongoing to determine the impact of changes in oil ash content and other characteristics of engine oil on exhaust emission control technologies and engine wear and performance.

It may also be possible to reduce the ash level in diesel exhaust by reducing oil consumption from diesel engines. Diesel engine manufacturers over the years have reduced engine oil consumption in order to reduce PM emissions and to reduce operating costs for engine owners. Further improvements in oil consumption may be possible in order to reduce ash accumulation rates in DPFs. In addition, measurements of NOx emissions for heavy-duty diesel vehicles equipped with passive catalyzed DPFs have shown an increase in the NO_2 portion of total NOx emissions, although the total NOx emissions remain approximately the same. In some applications, passive

catalyzed DPFs can promote the conversion of nitrogen oxide (NO) emissions to NO_2 during filter regeneration. More NO_2 is created than is actually being used in the regeneration process; and the excess is emitted. The NO_2 to NOx ratios could range from 20 to 70 percent, depending on factors such as the DPF systems, the sulfur level in the diesel fuel, and the duty cycle (DaMassa, 2002).

Formation of NO_2 is a concern because it irritates the lungs and lowers resistance to respiratory infections. Individuals with respiratory problems, such as asthma, are more susceptible to the effects. In young children, NO_2 may also impair lung development. In addition, a higher NO_2/NOx ratio in the exhaust could potentially result in higher initial NO_2 concentrations in the atmosphere which, in turn, could result in higher ozone concentrations.

Model simulations have shown that a NO_2 to NOx emission ratio of approximately 20 percent would nearly eliminate any impact of increased NO_2 emissions (DaMassa, 2002). According to the model, at the NO_2 to NOx ratio of 20 percent, there will be a decrease of the 24-hour ozone exposure (greater than 90 parts per billion) by two percent while an increase of the peak 1-hour NO_2 by six percent (which is still within the NO_2 standard).

The health benefits derived from the use of PM filters are immediate and offset the possible adverse effects of increases in NO_2 emissions. For this reason, a cap of 20 percent NO_2 to NOx emission ratio was established for all diesel emission control systems through the ARB Verified Diesel Emission Control System procedure (Verification Procedure). Any PM filter retrofit used to comply with the proposed amendments to the ATCM must be approved through the Verification Procedure. Any PM filter inherently part of a new Tier 3 or 4 engine used to comply with the proposed amendment need not go through California's Verification Procedure because such an engine would already have been shown to comply with Tier 3 or 4 new off-road engine emission standards.

Finally, DPFs can emit carbon dioxide (CO_2), a greenhouse gas, as a result of oxidizing PM. The contribution of CO_2 emissions from stationary diesel agricultural engines using DPFs, and how much these emissions contribute to global warming, is unknown.

3. Alternative Fuels

As discussed in Chapter VI of Staff Report: Initial Statement of Reasons for Proposed Rulemaking – Airborne Toxic Control Measure for Stationary Compression Ignition Engines, September 2003, a number of alternative fuels and alternative diesel fuels show great promise in their potential to reduce diesel PM emissions. These include biodiesel, Fischer-Tropsch fuels, and alternative fuels such as natural gas. No significant negative environmental impacts have been determined from the use of alternative fuels. With respect to alternative diesel fuels, there may be a slight increase in NOx emissions as a result of biodiesel use (Hofman/Solseng, 2002).

To ensure there are no adverse impacts from the use of alternative diesel fuels, the proposed amendments require any alternative diesel-fuel or fuel additives used in a stationary diesel agricultural engine to be verified under the ARB Verification Procedure. The Verification Procedure permits verification only if a multimedia evaluation of the use of the alternative diesel fuel or additive has been conducted. In addition, verification requires a determination by the California Environmental Policy Council that such use will not cause a significant adverse impact on public health or the environment pursuant to H&SC section 43830.8 (see Public Resource Code, section 71017).

4. Fuel Borne Catalysts

Another option for reducing diesel PM emissions is the use of fuel borne catalysts (FBCs). FBCs may be added to diesel fuel to decrease the ignition temperature of the carbonaceous exhaust in order to aid in soot removal from DPFs. When FBCs are used without a DPF, trace amounts would be emitted with the engine exhaust. Currently, a FBC should be used with a filter to capture emissions. The contribution of emissions from FBCs is unknown.

E. Reasonably Foreseeable Mitigation Measures

ARB staff has concluded that no significant adverse environmental impacts should occur from adoption of and compliance with the proposed amendments to the ATCM. Therefore, no mitigation measures would be necessary.

F. Reasonably Foreseeable Alternative Means of Compliance

Alternatives to the proposed amendments have been discussed earlier in Chapter IV of this Staff Report. ARB staff has concluded that there are no alternative means of compliance with the requirements of Health and Safety Code sections 39666 and 39667 that will achieve similar diesel PM emission reductions at a lower cost. Therefore, the proposed amendments provide the most effective and least burdensome approach to reducing public exposure to diesel PM and other air pollutants emitted from stationary diesel agricultural engines.

G. Environmental Justice

The ARB is committed to integrating environmental justice in all of its activities. In 2001, the Board approved Policies and Actions for Environmental Justice which formally established a framework for incorporating environmental justice into the ARB's programs, consistent with the directives of State law. Environmental justice is defined as the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulation, and policies. These policies apply to all communities in California, but recognize that environmental justice issues have been raised more in the context of low-income and minority communities. (ARB, 2001a)

The Policies and Actions for Environmental Justice are intended to promote the fair treatment of all Californians and to cover the full spectrum of ARB activities. Underlying these policies is a recognition that ARB needs to engage community members in a meaningful way as it carries out its activities. People should have the best possible information about the air they breathe and about what is being done to reduce unhealthful air pollution in their communities. ARB recognizes its obligation to work closely with all communities, environmental and public health organizations, industry, business owners, other agencies, and all other interested parties to successfully implement these policies. Chapter II, Section C, of this Staff Report generally describes the efforts made to apprise the stakeholders and the public about the development of the proposed amendments to the ATCM.

The proposed amendments are consistent with the environmental justice policy to reduce health risks from TACs in all communities, including low-income and minority communities. The proposed amendments will reduce diesel PM and other emissions from in-use stationary diesel agricultural engines in all California communities where these engines are used.

VI. ECONOMIC IMPACTS

This chapter presents the economic impacts associated with implementation of the proposed amendments. The amendments affect in-use stationary agricultural engines as well as non-agricultural applications. The amendments affecting the non-agricultural applications were proposed to clarify existing ATCM provisions, streamline fuel reporting requirements, and make other nonsubstantive changes, which are expected to be cost-neutral or produce slight cost-savings to affected businesses. Thus, this chapter discusses the economic impacts of the proposed amendments affecting in-use stationary agricultural engines, which are expected to impose costs upon affected businesses.

The discussion includes estimates of capital and recurring costs for the engine replacement scenario, which staff believes, for economic reasons, is the compliance option that nearly all of the affected businesses are most likely to use. An analysis of the proposed amendments' cost-effectiveness with regards to PM and NOx emissions is also provided.

A. Summary

Staff estimates that the total cost of the proposed amendments to affected businesses would range from $34 million to $42 million over the 22-year analysis period used (i.e., 2008-2029). No significant economic impacts to school districts, local public agencies, universities, State agencies, or federal agencies are expected because few, if any, of these agencies operate affected engines. ARB administrative costs for outreach and educational efforts to affected businesses and local air pollution control districts would be absorbed within existing budgets and resources.

Affected businesses may use several means to comply with the proposed ATCM including engine retrofit, engine replacement, and alternative technologies such as electric power or non-diesel alternative fuels. Table VI-1 summarizes the capital and annual per-engine costs of choosing the engine replacement compliance option, plus an expected range of local air district fees and owner/operator time to prepare and submit district paperwork. The annualized capital payments are based on the assumption that the capital cost is financed via a loan that is repaid over one to eight years at a five percent annual real interest rate.

Table VI-1. Estimated Cost-Per-Engine for Affected Businesses[1,5]

In-Use Engine Size (HP)	Capital Cost Range [2] ($)	Annual Cost Range [3] ($)
50 - 74	6,900 - 8,200	1,200 - 2,100
75 - 99	4,300 - 9,600	1,200 - 1,700
100 - 174	8,000 - 12,700	1,800 - 2,200
175 - 299	11,300 - 18,000	2,600 - 3,300
300 - 599	16,600 - 26,500	3,800 - 4,300
600 - 750	20,500 - 32,700	4,700 - 5,300
>750 (1725)[4]	21,700 - 172,200	21,500 - 26,900

1. Estimates include prorated loss-of-use costs for an in-use engine, one rebuild, and initial air district fees.
2. The capital cost estimate assumes a lump-sum, one-time cost.
3. This is the capital cost amortized over the remaining expected useful life of the engine, which, depending on the specific engine size category and emissions tier, varies from one to eight years. Includes a range of expected local air district fees and owner/operator time to prepare and submit registration forms and other air district paperwork. A real interest rate of five percent is used. The estimated amount represents uniform annual payments to cover the capital cost and local air district fees.
4. For the greater than 750 HP category, an engine size of 1,725 hp is used for calculation purposes. This is the largest size engine expected in this category.
5. Values have been rounded; for exact figures, please refer to the "Per-Engine Costs" worksheet in Appendix F.

For all directly-affected businesses, the compliance cost will vary depending on the number of affected engines that are owned and/or operated. Table VI-2 shows the estimated capital and annual cost for a typical and a small business with one to three engines. The annual costs include amortization of in-use engine loss-of-use and the expected range of local air district registration fees; after the loss-of-use costs are fully amortized, the annual costs drop substantially, amounting to local air district fees only.

Table VI-2. Estimated Costs for a Typical and a Small Business[4]

Engine Size (HP)	Capital Cost[1] ($)		Annual Cost[2] ($)	
	1 Engine	3 Engines	1 Engine	3 Engines
50 - 74	6,900 - 8,200	20,500 - 24,600	1,200 – 2100	3,700 - 6,400
75 - 99	4,300 - 9,600	12,900 - 28,700	1,200 - 1,700	3,600 - 5,100
100 - 174	8,000 - 12,700	23,800 - 38,000	1,800 - 2,200	5,500 - 6,500
175 - 299	11,300 - 18,000	33,700 - 53,900	2,600 - 3,300	7,800 - 9,900
300 - 599	16,600 - 26,500	49,700 - 79,400	3,800 - 4,300	11,500 - 12,900
600 - 750	20,500 - 32,700	61,400 - 98,100	4,700 - 5,300	14,200 - 15,800
>750 (1725)[3]	21,700 - 172,200	65,000 - 516,700	21,500 - 26,900	64,600 - 80,600

1. Estimates include loss-of-use cost for in-use engine(s), one rebuild per engine(s), local air district fees, and owner/operator time to prepare and submit registration forms and other air district paperwork.
2. This is the capital cost amortized over the remaining expected useful life of the engine, which, depending on the specific category and emissions tier, varies from one to eight years. Includes a range of expected air district fees and owner/operator time to prepare and submit registration forms and other air district paperwork. A real interest rate of five percent is used. The estimated amount represents uniform annual payments to cover both the capital cost and local air district fees.
3. For the greater than 750 hp category, an engine size of 1,725 hp is used for calculation purposes. This is the largest size engine expected in this category.
4. Values have been rounded.

Staff also estimated the proposed amendments' cost-effectiveness in terms of cost per pound of diesel particulate matter (PM) reduced. Diesel PM reduction resulting from the proposed amendments has been estimated to range from 63,000 to 250,000 pounds per year over the period from 2011 to 2026. Considering only the benefits of reducing primary diesel PM emissions, the average cost-effectiveness of the proposed amendments is $11 per pound of diesel PM reduced (the cost-effectiveness range is from $1 to $22 per pound of diesel PM reduced).

Additional benefits are expected to occur due to the reduction in reactive organic gases (ROG) and oxides of nitrogen (NO_x) emissions; ROG reduction benefits are not quantified in this analysis due to insufficient data. The estimated NO_x cost-effectiveness is discussed later in this chapter. Table VI-3 compares the cost-effectiveness of the proposed amendments with those of the adopted Transport Refrigeration Unit ATCM, Stationary Compression Ignition Engines ATCM, and the On-Road Heavy-Duty Residential and Commercial Solid Waste Collection Vehicles Control Measure.

Table VI-3. Cost-Effectiveness Comparison - Stationary Diesel Engine ATCM Proposed Amendments and Three Other Diesel PM ATCMs

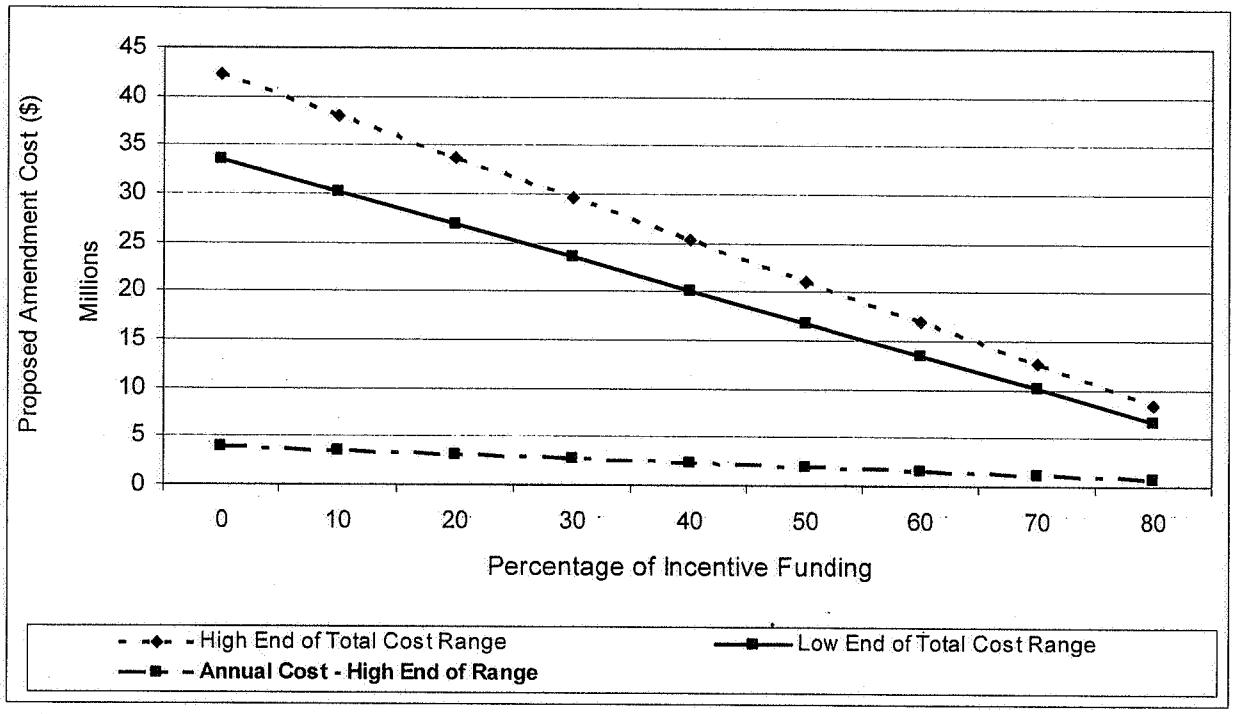
Regulation	Cost-Effectiveness
Proposed Amendments to the Stationary Diesel Engine Control Measure (Adoption Hearing scheduled for November 16 – 17, 2006)	$1 to $22 per pound of diesel PM reduced
Transport Refrigeration Unit ATCM (Adopted at an ARB Hearing on December 11, 2003)	$10 to $20 per pound of diesel PM reduced
Stationary Compression Ignition Engines ATCM (Adopted at an ARB Hearing on November 20, 2003)	$4 to $26 per pound of diesel PM reduced
On-Road Heavy-Duty Residential and Commercial Solid Waste Collection Vehicles Control Measure (Adopted September 25, 2003)	$67 per pound of diesel PM reduced

Source: ARB, 2003a; ARB, 2003b; ARB, 2003c

Based upon historical and current program activity levels, staff believes that some of the affected engines will be replaced under the incentive programs (Carl Moyer, EQIP, AG-ICE, etc.) discussed in Chapter II. Engines replaced under these programs will be replaced with either engines meeting current standards or electric motors. In addition, adoption of these proposed amendments will likely encourage affected engine owner/operators to switch to electric motors, especially in those cases where existing electric power service is close to the affected pump and the available electric service is of sufficient capacity. Staff estimates that approximately 20 percent of all affected engines will be replaced with electric motors, and the effect of these engines is taken into account in this analysis by reducing the affected engine population figures by 20 percent. Emission reductions attributable to the proposed amendments were also appropriately reduced. This adjustment reduces the cost of the proposed amendments, since a portion of the affected engines will come into compliance with funding by sources unrelated to the amendments.

Although it is not possible to determine the degree to which affected engines will be replaced under incentive programs, the potential effect of these incentive programs upon the estimated cost of the proposed amendments is illustrated in Figure VI-1.

Figure VI-1. Incentive Program Funding Effects on Proposed Amendment Cost[1]



1. The estimated proposed amendment total cost is expressed as a cost range, which assumes a compliance strategy of replacement of in-use engines with a new compliant diesel engine and payment of local air district registration fees. Since fees will vary by air district, an assumed range of air district fees was used in the total cost range estimates. Only the high end of the annual cost range is shown; annual costs (both low- and high-end) are shown at the bottom of the Reg Cost Summary worksheet in Appendix F.

Figure VI-1 is provided to illustrate the relative effect of incentive program funds upon the total cost of the proposed amendments; it is not intended to imply that local air district fees can be paid with incentive funds. Further information regarding the assumptions and methodologies used to estimate the proposed amendments' costs and economic impacts is provided in the remainder of this chapter and in Appendix F.

B. Legal Requirements Applicable to the Economic Impact Analysis

Government Code Section 11346.3 requires State agencies (including ARB) to evaluate the potential for adverse economic impacts on California businesses and individuals when proposing to adopt or amend any administrative regulation, including a regulation such as the proposed amendments. The evaluation must include the impact of the proposed regulation upon California jobs, business expansion, elimination, or creation; and businesses' ability to compete with those of other states.

Health and Safety Code Section 57005 further requires the ARB to perform an economic impact analysis of submitted alternatives to a proposed regulation before the adoption of any major regulation. A "major regulation" is defined as a regulation that would potentially cost California businesses more than 10 million dollars in any single year. Because the proposed amendments are not expected to cost California businesses more than 10 million dollars in any single year, no economic impact analysis of alternatives is necessary.

In addition, Government Code Section 11357 and guidelines adopted by the Department of Finance (DOF) require the ARB and other State agencies to estimate a proposed regulation's associated cost or savings to any local, State, or Federal agency. The agency proposing a regulation is also required to determine whether, as a result of the regulation, any cost to local agencies or school districts is reimbursable by the State. Pursuant to Government Code Section 17556, any cost to school districts, transit agencies, or other local public agencies as a result of the proposed amendments would not be reimbursable because private sector businesses would be subject to the same requirements and costs (ARB, 2002).

The proposed rulemaking does not constitute a reimbursable mandate because the proposed amendments apply to all entities that operate the affected engines in the state and does not impose unique requirements on local agencies (County of Los Angeles vs. State of California, 43Cal 3d 46 [Jan 1987]).

C. Economic Impact Analysis

1. Assumptions Used in This Analysis

This analysis is performed in the year 2006 and all costs are given in 2005 dollars (unless otherwise stated). Where future costs are mentioned, they have been adjusted to 2005 dollars using standard accepted economic analysis procedures. A real interest rate of five percent (a seven percent nominal rate minus an assumed two percent inflation rate) is used throughout this analysis, unless otherwise noted.

Initial (or capital) costs, as discussed in this chapter, are the up-front costs of a compliance strategy. The initial costs are expressed as a uniform series of payments over the remaining useful life of the engine being replaced, using a real interest rate of five percent. The interest rate for capitalization is assumed to reflect the current borrowing costs to affected businesses.

All cost and cost-effectiveness estimates are based upon an affected engine population that excludes affected engines located within the boundaries of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and the South Coast Air Quality Management District (SCAQMD) and includes the rest of California. In-use stationary agricultural engines that would be affected by the proposed amendments in the SJVUAPCD/SCAQMD are already either subject to or in the process of being subject to local air district rules paralleling the proposed amendments. For this reason, the

emission reductions (both PM & NO_x), as well as the compliance costs, are not included in this analysis.

An undetermined number of affected engines may qualify for the remote location exemption discussed elsewhere in this report. All of the cost and cost-effectiveness estimates presented in this report assume that none of the affected engines will take advantage of this exemption, since the number of engines that may be exempted is unknown.

Appendix F contains the affected in-use engine population data table and a discussion of its use in generating the cost and cost-effectiveness estimates in this report. Although there are no affected engines in the greater-than-750 hp category outside of the SJVUAPCD, cost information for this category is provided for completeness.

These cost estimates are based on current and known technology; staff believes that it is likely that the costs will decrease as technology improves and production and sales volumes increase. The impact of ARB Verified Diesel Emission Control Strategies (VDECS) certification costs upon in-use compliance technology costs to the end users will vary according to product sales volumes and the degree of certification testing required for a given product. Compliance technology costs used in this staff report reflect manufacturers' best-estimated retail installed product costs.

Since the costs of many items in this analysis are subject to change and vary between different vendors, cost averages or ranges are used in developing the estimated cost impacts of the proposed amendments. In addition, costs to a directly-affected business will vary according to the actual quantities, ages, and size(s) of affected engines that they may have.

Estimated costs for the proposed amendments are those within the 2008 to 2029 time period. This period was chosen to include the major portion of costs attributable to the proposed amendments. This time period (and the estimated costs) encompasses the capital cost amortization periods for all of the affected engine categories. It should be noted that local air district fees paid by the affected owner/operators are expected to be incurred until the engine is taken out of service; they are attributed to the estimated cost of the proposed amendments only until the end of the capital cost amortization period (2029.) The cost-effectiveness figures discussed in this chapter may use analysis periods that vary slightly from the estimated cost analysis period; where this occurs, the different analysis period is noted.

The affected engines are replaced or rebuilt as they wear out or fail; anecdotal information indicates that an unknown number of these engines are rebuilt repeatedly rather than replaced. In the past, due to long engine model lifespans and parts commonality among models, rebuild component availability at low prices made this rebuild practice quite feasible. As newer engines adopt electronic controls and the availability of replacement products for older decreases, the practice of repeatedly rebuilding an engine will decrease. Due to the lack of data regarding rebuilding

frequency and count, its effect is not quantified in this analysis beyond the assumption that each affected engine is rebuilt once as described below.

It is assumed that owner/operators replace or rebuild these engines on a periodic basis. Typical practice is to rebuild an engine at roughly 10,000 hours of use (assumed to be at the rate of 1,000 operating hours per year) after it has been placed in service, though this figure does vary widely according to use and care. In addition, the rebuild cost may also vary widely, as it is dependent upon an engine's exact condition, which may again vary widely. Replacement with a new engine is a more common strategy in the smaller engine sizes, as the rebuild cost is closer to the price of a new engine for the smaller engines. For the purposes of this analysis, it is assumed that an in-use engine is rebuilt once 10 years after its placement into service, and the cost of the rebuild is equal to 50 percent of the new engine purchase price.

a. Directly-Affected Businesses

The businesses directly affected by the proposed amendments are farms and ranches using compression-ignition (diesel) powered engines (producing greater than or equal to 50 horsepower) for the purposes of raising crops and/or animals. These businesses will incur the estimated compliance costs as outlined later in this chapter, which include loss-of-use for existing engines and local air district registration fees.

The United States Department of Agriculture (USDA) conducts periodic surveys of farm and ranch operators in conjunction with its Census of Agriculture. A portion of the most recent survey report, the 2003 Farm and Ranch Irrigation Survey (FRIS) contains data regarding the operational and equipment inventory characteristics of U.S. farms and ranches.

The survey shows that there are 3,895 (3,900 rounded) farms operating pumps powered by diesel-fueled engines in California. Data on a by-county basis was not available, so it was not possible to delete those affected farms in the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) and the South Coast Air Quality Management District (SCAQMD). Approximately one-half of the affected engines are located in the SJVUAPCD. However the number of engines per farm can vary widely, and for this reason the percentage of engines located in the local air districts cannot be applied to the number of statewide affected farms to delete those in the SJVUAPCD and SCAQMD. In addition, since the proposed amendments do not affect those stationary agricultural engines with less than 50 hp, and an unknown percentage of the 3,895 farms with diesel-fueled pumps may have engines with less than 50 hp and are not affected by the proposed amendments. The 3,895 figure is very conservative and the actual number of directly-affected businesses is expected to be somewhat less USDA, 2002b).

b. Indirectly-Affected Businesses

Indirectly-affected businesses include those that design, manufacture, distribute, and sell diesel engines and related accessories for this application, as well as both engine manufacturer-authorized dealers and independent service providers that install, maintain, rent, and repair these engines. Other potentially affected businesses include electric power providers, fuel suppliers, and those businesses that design, manufacture, sell, install, maintain, and repair approved diesel exhaust after-treatment devices for these engines.

Staff has identified nine engine manufacturers that design and produce engines affected by the proposed amendments; none of them are located in California. However, their authorized distributors and dealers are located in California. The total number of affected California authorized distributors/dealers is estimated at 113, based on visiting the Internet websites of the affected manufacturers and using the "dealer locator" webpage feature (Cook, 2006b). Additionally, an unknown number of independent engine service providers (IESP) outside of the engine manufacturer/distributor/dealer network may be affected. To the extent that engines are replaced rather than rebuilt as is current practice, those businesses that perform this service may see a decrease in revenues until the new replacement engines are ready to be rebuilt. Scrap metal and other businesses that deal in used engines may see an increase in revenue as a result of in-use engines being scrapped or sold to make way for new engines.

There may be a very small number of these engines owned by public agencies or universities that may be affected. Also, the local air districts will be affected, as they will have the primary implementation and enforcement authority for these proposed amendments.

The United States 2002 Economic Census was consulted to determine the number of IESPs within California; however, IESP data are combined with many other types of machinery and equipment repair and service providers. As a result, it is not possible to estimate the number of affected IESPs (U.S. Census Bureau, 2002).

c. Determination of Typical and Small Business Size

Section 11342.610 of the California Government Code defines an agricultural small business as one that does not include those independently owned and not dominant in its field of operation and "...where the annual gross receipts exceed one million dollars ($1,000,000)." Applying this definition to the FRIS data shows that 92 percent of California irrigated farms have total annual agricultural product sales of $999,999 or less. The total irrigated farm population is divided into product sales segments (by dollar range of sales; $25,000 to $49,999, for example); the lowest segment, less than $25,000 in sales, contains 49 percent of the irrigated farms. (USDA, 2002b)

Since approximately 92 percent of the affected businesses are considered small businesses, the typical business can be considered a small business and the cost

estimates developed for a small business can also be used for a "typical business" scenario, though the exact cost will depend upon the factors discussed below.

Factors such as crops raised, availability and cost of irrigation water sources, nature of irrigation water distribution, soil composition, and climate influence the number of irrigation pumps for a given business. In addition, fuel costs, electric power costs, and availability of electric service and its capacity heavily influence businesses' decision as to the appropriate energy source for powering irrigation pumps. Due to all of these factors, it is not possible to develop an accurate and representative profile of a typical business. However, for discussion purposes, extrapolation was used to determine a range of one to three affected diesel engines for a typical business. The methodology used for this extrapolation is shown in Appendix F.

d. Business Impacts/Competitiveness Discussion

Directly-affected businesses will either absorb or pass on their compliance costs. Those California businesses that have a majority of the share of the market for their product (walnuts, for example) will be able to pass on their costs, since they are able to set the market price, to a degree. California businesses selling products that are produced in other states and for which California businesses do not have a majority of the market share (oranges, for example) will have to absorb the compliance costs.

The proposed amendments apply to existing businesses and use existing technologies. It may lead to the creation or elimination of businesses. Due to the long lead time given for compliance and a range of compliance options, staff believes that most businesses will be able to meet the compliance costs. However, it is possible that a small number of businesses (those with marginal profitability) may have difficulty in complying with these amendments. Staff believes that these amendments may lead to the alteration of job duties within existing businesses, as well as a small increase in new jobs due to the creation of business opportunities as discussed below. This may be offset by the loss of a few businesses (and attendant jobs) that are unable to comply with the proposed amendments. Staff believes that there will be little or no significant change in the total number of businesses or jobs.

Businesses that may be created include those that: furnish, install, and maintain diesel emission control systems, scrap used engines, and provide alternative (non-diesel) in-use compliance strategies. Economic productivity may be reduced as businesses devote labor and capital to comply with the proposed amendments. Individuals may be impacted to the extent that affected businesses are able to pass on the compliance costs to their customers.

e. Cost Discussion

The proposed amendments (emission standards) are intended to reduce public exposure to diesel particulate matter (diesel PM), a toxic air contaminant, from in-use stationary diesel-fueled engines that are used in agricultural applications, primarily

involving irrigation uses. The standards may be met by replacing engines with those meeting the new standards, retrofitting existing engines with approved control devices, or the use of non-diesel alternatives, such as conversion to electric power or use of alternative fuels. For economic reasons, staff believes that engine replacement will be the most popular compliance option chosen by the affected owners/operators. Thus, the cost analysis for the proposed amendments focuses on engine replacement as the primary compliance strategy.

For the retrofit option, drawbacks include: the availability of verified systems (many of these engines are relatively old, compared to other diesel engine categories), possible source test requirements imposed by local air districts, and possible in-use monitoring requirements to ensure proper system function. The sum of these costs may exceed the cost of a new engine, especially for the smaller engine sizes.

Alternative fuel use has not been considered cost-effective given past relatively inexpensive diesel fuel prices; however, the recent upswing in diesel fuel prices may make alternative fuels attractive as a compliance option. Current limited availability of many alternative fuels is a concern. Electric power is considered the most viable alternative (in most locations) at the present time; the majority (83 percent) of irrigation pumps are powered by electric motors (USDA, 2002b). Concerns about sufficient electric service availability and capacity, especially in light of the remote locations of many of these engines, preclude statewide requirements for conversion to electric power.

U.S. EPA has set forth more stringent emission requirements (commonly referred to as Tier 3 and Tier 4 engine standards) for new diesel engines; these requirements are already taking effect and are being implemented by engine horsepower category and engine model year. These requirements apply to all engines in this use category sold nationwide and are taking place independent of any rulemaking actions (such as these proposed amendments) in California. The difference in cost between a Tier 3 or Tier 4 engine and older engines is not relevant to the estimated cost of these proposed amendments. Anyone purchasing a new engine for any reason, including a normally scheduled replacement for a worn-out or damaged engine, at or before the compliance deadlines in the proposed amendments, will be purchasing a compliant engine, provided that they are not buying an engine that has been in dealer stock for an unusually long period of time.

The proposed amendments will likely encourage the replacement of in-use engines according to a specific timeline; keeping a current in-use engine in service indefinitely by rebuilding it multiple times will not be possible. Staff is unable to quantify this practice, but recognizes that it does occur and assumes the cost of one rebuild per engine. This is a conservative approach, as many owner/operators with affected engines that are near their rebuild date and the proposed amendment compliance date will choose to forego the rebuild expense and replace their engine.

The compliance costs that a directly-affected business will incur will depend upon the choice of compliance option(s) that the business elects to use, as well as the number and size of affected engines that they have. In addition, the degree to which businesses successfully take advantage of incentive programs such as AG-ICE, Carl Moyer, and EQIP will also affect their net compliance costs. This analysis and discussion assume than no portion of the compliance cost is covered by incentive programs.

Since the proposed amendments require in-use engines to be replaced according to a specified timetable, affected owners/operators will incur the cost of a new engine or a switch to a non-diesel alternative sooner than would be expected if the proposed amendments did not exist. Thus, the loss-of-use experienced by an owner/operator is the majority of the cost impact of these proposed amendments. The remainder of the incurred costs are expected to result from owner/operator local air district registration costs.

f. Loss-of-Use Costs

Loss-of-use costs are those incurred by affected owner/operators who do not receive the full expected life from their engines as a result of earlier-than-anticipated replacement required by the proposed amendments. Quantification of this amount was calculated by taking the current price of a new equivalent size (HP) engine and the cost of an average rebuild (assumed to be 50 percent of the cost of a new engine) and prorating these costs using the expected remaining life of both the engine and its last rebuild. Prorating of the costs was done to reflect the belief that it is not appropriate to assign the entire cost of engine replacement to the proposed amendments, since businesses periodically replace engines as a normal part of their day-to-day operations. This cost was then amortized over the number of years of expected remaining life of the engine; it was assumed that the median engine life is 20 years, with an annual usage of 1,000 hours. Also assumed is that these engines are rebuilt at the 10,000 operating hour (ten year) point. Table F-2 in Appendix F lists the amortization periods by engine size and U.S. EPA emission certification tier standards. A detailed discussion of the methodology used and specific cost information for each affected engine horsepower category and emission standard tier is in Appendix F.

The new engine costs used were obtained from California dealers in 2005 and reflect the cost of a "power unit," which is the configuration that an engine for this application is normally purchased. For each engine size (horsepower) category, an average engine price was determined from quoted engine prices for sizes towards the high end of the category. The power unit price includes all accessories and controls needed to operate the engine. These prices are listed on the "Engine&Motor Costs" worksheet in Appendix F.

The estimated loss-of-use costs for the range of affected engines are given in Table VI-4. Costs vary within an engine category due to varying amounts of expected

remaining life for different engine subcategories (emission tiers) and differing proposed amendment compliance dates.

Table VI-4. Estimated Per-Engine Loss-of-Use Costs by Engine Size (hp)[2]

Engine Size (hp)	Loss of Use (Lump Sum Basis) ($)	Loss of Use (Annual Payments Basis) ($)
50 to 74	6,700 to 8,000	1,200 to 1,900
75 to 99	4,200 to 9,400	1,200 to 1,500
100 to 174	7,800 to 12,500	1,800 to 1,900
175 to 299	11,100 to 17,800	2,600 to 3,100
300 to 599	16,400 to 26,300	3,800 to 4,100
600 to 750	20,300 to 32,500	4,700 to 5,000
>750[1]	21,500 to 172,100	21,500 to 26,600

1. For estimation purposes, a size of 1,725 hp was assumed for this category.
2. Loss-of-use amounts vary due to varying amounts of expected remaining life for different engine subcategories (emission tiers) and differing proposed amendment compliance dates.

Using the per-engine loss-of-use costs and the affected engine population composition from the emissions inventory, the total loss-of-use cost for the proposed amendments are calculated on the "Reg Cost" worksheet in Appendix F.

g. Local Air District Registration Fees

For compliance purposes, affected engines will need to be identified by the local air districts. This will involve the engine owner/operator providing engine registration information to the local air district. It is assumed that the local districts will fully recover their costs by charging fees to the affected owner/operators. Two local air districts are currently in the rulemaking process to adopt registration or permitting programs and fees; the lower of the two district fee schedules was used for low end of the estimated fee range, while a modified version of ARB's Portable Equipment Registration Program (PERP) fee schedule was used for the high end. Further discussion regarding district fees is located in Appendix F.

The proposed amendments require the local air districts to collect and maintain information on the affected engines. In addition, the local air districts are primarily responsible for enforcement of these proposed amendments; previously, these engines were not tracked by either air districts or ARB, since they were under an agricultural exemption.

Where local air districts already have sufficient information on an affected engine (engines replaced with Moyer incentive funding assistance or otherwise subject to district permitting), discounted fee schedules may be used in some cases. The degree to which affected engines may qualify for discounted fees is unknown and, for the purposes of this analysis, it is assumed that none of the affected engines qualify for discounted fees.

The owners/operators of the affected engines will have to submit information about their engines to their local air districts. It is anticipated that the yet-to-be established procedures, which may differ by district, will start with a registration process, which would require the submittal of basic information including, but not limited to, the type, number, location, proximity to receptors, and operating characteristics of their engines. It is assumed that the completion of the registration form by the owner/operator will take approximately two hours, at a cost of $50 per hour, for a total of $100 per affected engine. Subsequent renewals/updates are expected to take a minimal amount of time and are not reflected in the cost estimates.

Table VI-5 summarizes the range of local air district fees used to estimate the cost of the proposed amendments. The low-end scenario assumes that an initial registration fee will be paid by the owner/operator of the affected engine as soon as the proposed amendments take effect (assumed to be in year 2008) and an annual renewal fee will be paid each subsequent year that the engine is kept in service. For the high-end scenario, the owner/operator will pay the initial registration fee in 2008, then pay a renewal fee that does not include inspection until the year that the affected engine must comply with the proposed lower emission standards, and then pay a higher inspection-included renewal fee for subsequent years that the engine is in service.

Table VI-5. Estimated Range of Per-Engine Owner/Operator Local Air District Fees

Fee Type	Low ($)	High ($)
Initial Registration (low end) - Basis: San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) Rule 3155 (inspection fee included in registration fee) ($45) - Includes $100 Cost Allowance (2 hrs. @ $50/hr.) for Affected Owner/Operator Completion/Submission of Registration Application to Local Air District	145	
Initial Registration (high end) - Basis: ARB PERP, 3-Year Fee Divided by 3 = $90 - Includes $100 Cost Allowance (2 hrs. @ $50/hr.) for Affected Owner/Operator Completion/Submission of Registration Application to Local Air District		190
Renewal (low end) - Basis: SJVUAPCD Rule 3155 - Includes Inspection Fee	26	
Renewal (high end) - Basis: ARB PERP Current Fee Schedule; Proposed PERP Fee Schedule Revisions - Renewal Fee for Years After Initial Registration But Before Engine Replacement (does not include inspection fee) - Renewal Fee for Years Including Engine Replacement Year and Thereafter ($75 renewal fee plus $167 inspection fee; assumes triennial inspection of registered engine)		75 242

Source: SJVUAPCD, 2005; ARB, 2006b

Using a range of one to three affected engines that a typical and small business is expected to have, the range of expected fees for a directly-affected business is summarized in Table VI-6.

Table VI-6. Estimated Range of Owner/Operator Local Air District Fees for a Typical and Small Business

Fee Type	1 Engine	3 Engines
Initial Registration		
Low-End	$145	$435
High-End	$190	$570
Renewal		
Low-End	$26	$78
High-End	$242	$726

Some districts may need to assess fees that are higher than the estimates given in Tables VI-5 and VI-6. These higher fees may be driven by factors including, but not

limited to, the frequency of local air district inspections of the affected engines, local air district staff resource needs, and other local air district resource needs associated with implementation and enforcement of the proposed amendments.

h. Total Cost of Proposed Amendments

The overall total cost is the sum of all costs that affected engine owners/operators would pay as a result of the adoption of the proposed amendments; these costs are the loss-of-use and local air district fees.

The overall total cost for the proposed amendments is estimated at $34 million to $42 million, over the 22-year analysis period (2008 to 2029). Overall annual costs are estimated to be within the range of $60,000 to $3.9 million per year during the same time period previously mentioned. Tables VI-1 and VI-2 summarize the per-engine as well as the typical and small business costs. The year-by-year costs, as well as the subtotals for each affected engine size category, are listed in the "Reg Cost Summary" worksheet in Appendix F.

D. Analysis of Potential Cost Impacts Upon Governmental Agencies

The scope of affected governmental agencies may include federal, State, and local agencies and municipalities, including school districts and colleges.

1. Costs to ARB

One-time expenses for local air district assistance and the development of registration and health-risk screening tools and guidelines are expected and will be absorbed within existing budgets and resources in the 2007 fiscal year. It is estimated that 0.75 person-years (PYs) of staff time will be needed to perform these tasks, at an approximate cost of $62,000.

2. Costs to Other State Agencies

An extremely small number (less than 10) of affected engines are operated by other state agencies or universities (both the California State University (CSU) and University of California (UC) systems). State prisons and universities were surveyed to determine the extent to which they might have affected engines. Four state prisons and two universities within the CSU systems were identified as possibly having engines subject to these proposed amendments (Cook, 2005a; Cook, 2005b). Based on this information, it is expected that the total number of affected engines operated by State agencies is very small; therefore, any compliance costs will have a negligible impact on other State agencies.

3. Costs to Other Governmental Agencies (Other Than State Agencies)

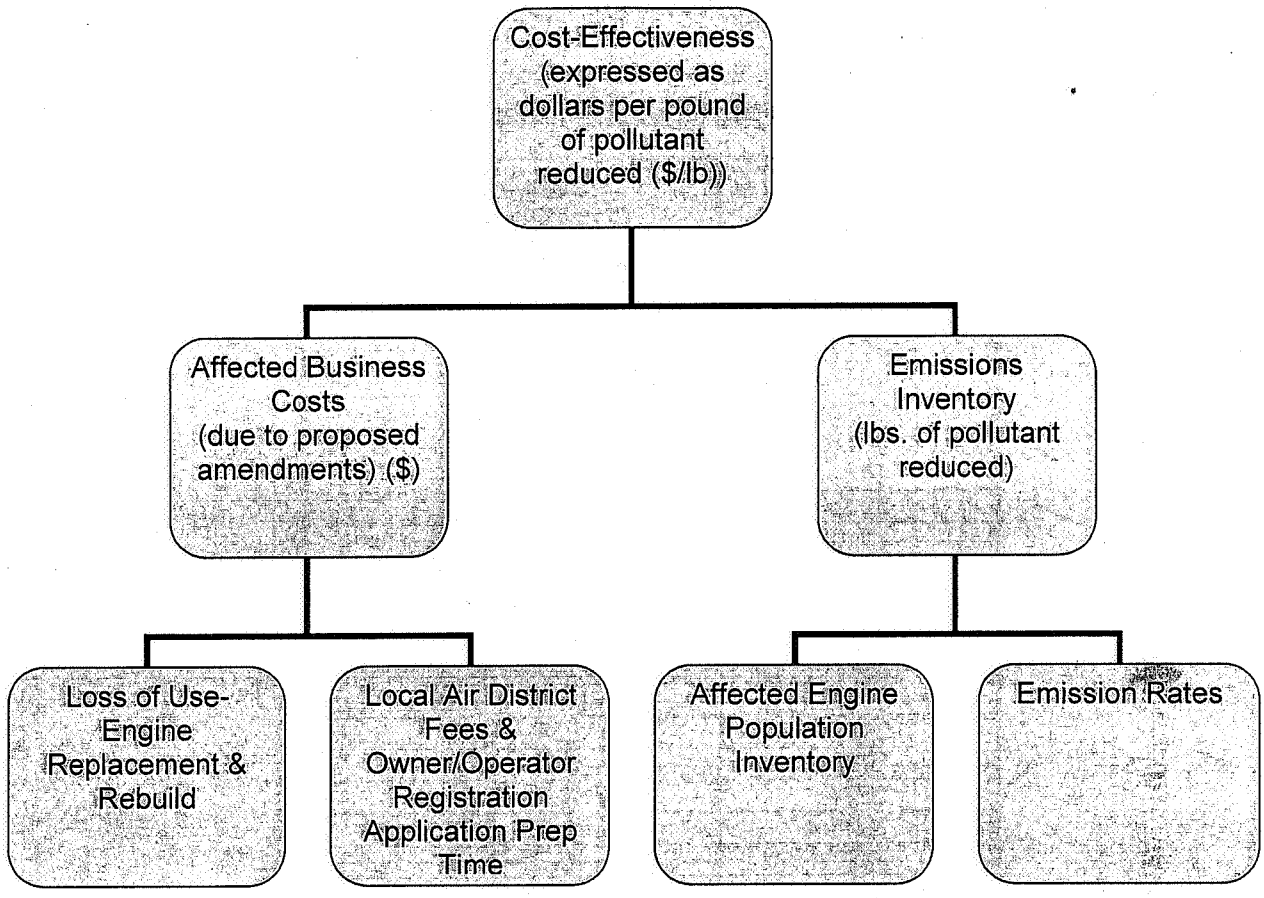
Other governmental agencies include school districts, as well as federal and local governmental agencies. Local municipalities or school districts that operate affected engines may experience compliance costs to the extent that they own and/or operate the affected engines. Staff has been unable to identify any affected engines operated by these school districts and agencies; if any exist, staff expects that they represent an insignificant portion of the total statewide population.

As previously discussed, the owners/operators of the affected engines will have to submit information about their engines to their local air districts. It is anticipated that the yet-to-be established procedures, which may differ by district, will start with a registration process, which would require the submittal of basic information including, but not limited to, the type, number, location, proximity to receptors, and operating characteristics of their engines. It is assumed that the completion of the registration form by the owner/operator will take approximately two hours, at a cost of $50 per hour, for a total of $100 per affected engine. Subsequent renewals/updates are expected to take a minimal amount of time and are not reflected in the cost estimates. It is expected that local air districts will fully recover their costs under the authority granted to them in the California Health & Safety Code, sections 40702, 40727.2(j), and 41512.5 in conjunction with the registration requirements in the proposed amendments.

E. Cost-Effectiveness Analysis of the Proposed Amendments

Health and Safety Code Sections 39658 & 39665 through 39667 require ARB to determine the need and appropriate degree of regulation for substances identified as toxic air contaminants. A portion of this determination is the estimation of the cost-effectiveness of the proposed regulation (amendments). Basically, the cost-effectiveness is the ratio of the regulation cost divided by the emissions benefits produced by the regulation; for ATCMs, the cost-effectiveness is typically expressed in dollars per pound of pollutant avoided. Figure VI-2 illustrates the components of the cost-effectiveness figure.

Figure VI-2. Cost-Effectiveness Calculation Diagram



The cost effectiveness for the proposed amendments was calculated using two different conventions, to provide equal and meaningful comparisons with other air quality measures. For both calculation conventions, both compliance costs and emission reductions estimated from implementation of the proposed amendments include all areas of California except for the San Joaquin Valley Unified Air Pollution Control District and the South Coast Air Quality Management District.

1. Overall Cost-Effectiveness for Diesel PM (DPM)

The overall cost-effectiveness figure uses the sum of all proposed amendment costs (loss-of-use and local air district fees) and the total DPM reductions attributable to the proposed amendments. Since the proposed amendments have costs (local air district fees) in years that do not have corresponding emission reductions, the years without emission reductions are omitted from the cost-effectiveness analysis period. For the overall cost-effectiveness, the analysis period is the years during which there are emission reductions, 2011 to 2029. Although the costs incurred during years without emission reductions are not used in the overall cost-effectiveness calculations, they are

accounted for and included in the total overall cost of the proposed amendments as discussed in Section C.1.h. earlier in this chapter.

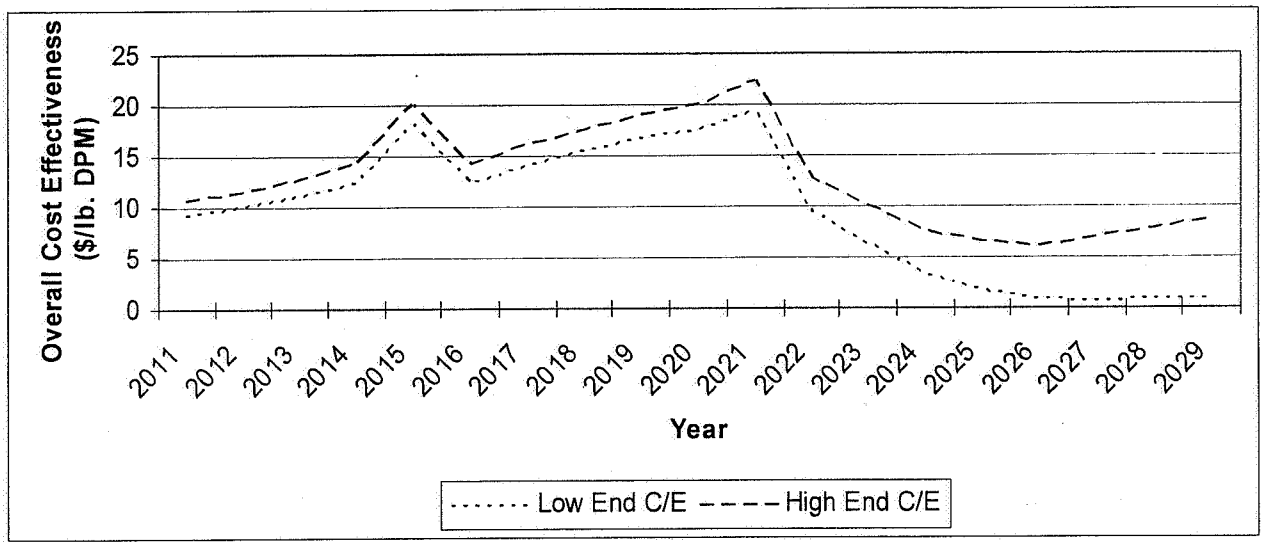
Table VI-7. Overall Cost-Effectiveness of the Proposed Amendments

Year	Overall DPM Cost-Effectiveness ($/Lb.)
2008	[a]
2009	[a]
2010	[a]
2011	9.12 – 10.54
2012	9.97 – 11.48
2013	10.98 – 12.65
2014	12.21 – 14.07
2015	18.06 – 19.96
2016	12.37 – 14.23
2017	13.92 – 15.94
2018	15.33 – 17.53
2019	16.65 – 19.03
2020	17.45 – 20.06
2021	*19.38 – 22.29*
2022	9.34 – 12.62
2023	6.26 – 9.96
2024	3.26 – 7.44
2025	1.70 – 6.41
2026	*0.76 – 6.09*
2027	0.73 – 6.78
2028	0.82 – 7.67
2029	0.93 – 8.68

a. Cost-effectiveness cannot be calculated for this year due to zero emission reduction.

For the period from 2011 to 2029, the average overall cost-effectiveness of the proposed amendments is $11 per pound of diesel PM reduced (the cost-effectiveness range is from $1 to $22 per pound of diesel PM reduced). The variation in cost effectiveness, which is due to the differing costs and emission reductions during implementation period, is illustrated in the figure on the next page.

Figure VI-3. Overall Cost-Effectiveness of the Proposed Amendments[1]



1. "C/E" means cost-effectiveness.

2. Cost-Effectiveness for Diesel PM and NO_x

Since many diesel PM control strategies also indirectly reduce NO_x emissions, another way of evaluating an emission control program is to split the control costs evenly and divide each half by the estimated diesel PM and NO_x reductions to produce cost-effectiveness figures for both diesel PM and NO_x. For this method, the loss-of-use cost and the estimated local air district fee range constitute the total cost.

The analysis period for this method is 2011 to 2029; the range of cost-effectiveness is: $0.36 to $11 per pound for diesel PM, and from $0.02 to $0.67 per pound for NO_x. A detailed table of the year-by-year cost-effectiveness values is shown on the next page.

Table VI-8. DPM and NOx Cost-Effectiveness Range Using the Split-Cost Method

Year	DPM and NO_x Cost-Effectiveness Range	
	DPM ($/lb.)	NO_x ($/lb.)
2011	4.56 – 5.27	0.27 – 0.31
2012	4.98 – 5.74	0.29 – 0.34
2013	5.49 – 6.32	0.32 – 0.37
2014	6.11 – 7.03	0.35 – 0.41
2015	9.03 – 9.98	0.51 – 0.56
2016	6.18 – 7.11	0.38 – 0.43
2017	6.96 – 7.97	0.42 – 0.48
2018	7.67 – 8.76	0.46 – 0.53
2019	8.32 – 9.51	0.50 – 0.57
2020	8.72 – 10.03	0.52 – 0.60
2021	9.69 – 11.15	0.58 – 0.67
2022	4.67 – 6.31	0.28 – 0.38
2023	3.13 – 4.98	0.19 – 0.30
2024	1.63 – 3.72	0.10 – 0.22
2025	0.85 – 3.20	0.05 – 0.19
2026	0.38 - 3.05	0.02 – 0.18
2027	0.36 - 3.39	0.02 – 0.20
2028	0.41 – 3.84	0.03 – 0.23
2029	0.47 – 4.34	0.03 – 0.26

VII. REFERENCES

ARB, 1985. California Air Resources Board. Facts About The Effect of Smog on California Plants. Sacramento, California. 85 80082.

ARB, 2000. California Air Resources Board. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel Engines and Vehicles. Sacramento, California. October 2000.

ARB, 2001a. California Air Resources Board. Policies and Actions for Environmental Justice. Sacramento, California. April 2001.

ARB, 2001b. California Air Resources Board. ARB Fact Sheet: Air Pollution Sources, Effects and Control, http://www.arb.ca.gov/research/health/fs/fs2/fs2.htm. Sacramento, California. October 4, 2005.

ARB, 2002. California Air Resources Board. Staff Report: Initial Statement of Reasons for Proposed Rulemaking Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools. Sacramento, California. October 2002.

ARB, 2003a. California Air Resources Board. Staff Report: Initial Statement of Reasons, Supplemental Report, Proposed Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Residential and Commercial Solid Waste Collection Vehicles. August 8, 2003.

ARB, 2003b. California Air Resources Board. Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Airborne Toxic Control Measure for Stationary Compression-Ignition Engines. Sacramento, California. September 2003.

ARB, 2003c. California Air Resources Board. Staff Report: Initial Statement of Reasons for Proposed Rulemaking. Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate. Sacramento, California. October, 2003.

ARB, 2003d. "Air Resources Board Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk." October 9, 2003.

ARB, 2004. California Air Resources Board. Memorandum from Catherine Witherspoon, Executive Officer, to Alan Lloyd, Chairman and Honorable Board Members: Update on In-Use Stationary Diesel Agricultural Engine Electrification Investigation. Sacramento, California. August 13, 2004.

ARB, 2005. California Air Resources Board. Staff Report: Initial Statement of Reasons for Proposed Revisions to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines. Sacramento, California. April 2005.

ARB, 2006a. California Air Resources Board. The Carl Moyer Memorial Air Quality Standards Attainment Program Guidelines, Approved Revision 2005. Sacramento, California. January 2006.

ARB, 2006b. California Air Resources Board. Fees for Statewide Portable Equipment Registration Program. http://www.arb.ca.gov/portable/perp/fees.htm March 20, 2006.

CCM, 2005. California Citrus Mutual. Statement to the International Trade Commission: The Effects of EU Policies on the Competitive Position of the U.S. & EU Horticultural Products Sectors, Investigation No. 332-423, April 26, 2001. http://cacitrusmutual.com/statement_international.html. February 9, 2005.

Cook, 2005a. January 21, 2005 e-mail correspondence from Barbara Cook, ARB, to Tony Andreoni, ARB.

Cook, 2005b. February 22, 2005 e-mail correspondence from Barbara Cook, ARB, to Tony Andreoni, ARB.

Cook, 2005c. Personal Communication (conference call), Shirley Batchman, California Citrus Growers, to Tony Andreoni, Amy Castello, and Barbara Cook, ARB Stationary Source Division, May 9, 2005. Personal Communication (telephone conversation), Don Gabe, Pacific Distributing, to Barbara Cook, ARB Stationary Source Division, May 10, 2005. Personal Communication (telephone conversation), Roger Hines, Amarillo, to Barbara Cook, ARB Stationary Source Division, May 10, 2005.

Cook, 2006a. Confidential. Personal Communication (conference call, telephone conversations, and email) engine manufacturers, distributors, and dealers to Barbara Cook, ARB Stationary Source Division, October 2005 through January 2006.

Cook, 2006b. April 5, 2006 e-mail correspondence from Barbara Cook, ARB, to Jon Manji, Richard Boyd, and Ron Walter (all ARB).

DaMassa, 2002. DaMassa, John. Presentation: Air Quality Effects of Trap-Related Emissions (Updated). California Air Resources Board, Sacramento, California. February 6, 2002.

Hofman/Solseng, 2002. Hofman, V. and Solseng, E. Presentation: Biodiesel Fuel Use in an Unmodified Diesel Engine. American Society of Agricultural Engineers Annual Meeting; September 27-28, 2002.

Kendall, 2002. Kendall, Tom; Johnson Matthey. "Platinum 2002;" http://www.platinum.matthey.com/publications/1051543656.html. May 2002.

Kendall, 2003. Kendall, Tom; Johnson Matthey. "Platinum 2003;" http://www.platinum.matthey.com/publications/1059138410.html. May 2003.

MEAB,2003. Metallextraktion AB (MEAB). http://www.meab-mx.se/en/index.htm. August 2003.

NRCS, 2003. United States Department of Agriculture Natural Resources Conservation Service. Program Description: Farm Bill 2002 Environmental Quality Incentives Program. June 2003.

NRCS, 2005. United States Department of Agriculture Natural Resources Conservation Service Presentation: USDA - Natural Resources Conservation Service Environmental Quality Incentives Program (EQIP). January 5, 2005.

OEHHA, 1999. Office of Environmental Health Hazard Assessment. Air Toxics Hot Spots Program Risk Assessment Guidelines, Part 1: Determination of Acute Reference Exposure Levels for Airborne Toxicants. Sacramento, California. March 1999.

OEHHA, 2001. Office of Environmental Health Hazard Assessment. Prioritization of Toxic Air Contaminants Under the Children's Environmental Health Protection Act, Appendix C-1 Chemical Toxicity Summary for Tier 1 Toxic Air Contaminants - Particulate Emissions from Diesel-Fueled Engines (Pages 1-27). Sacramento, California. October 2001.

Phillips, 2005. Personal Communication (telephone conversation), Professor John Phillips, Cal Poly, San Luis Obispo, to Barbara Cook, ARB Stationary Source Division, February 9, 2005.

PUC, 2005. California Public Utilities Commission. "Application of Pacific Gas and Electric Company (U 39 E) and Southern California Edison Company (U 338 E) for Rate and Line Extension Incentives for Conversion of Stationary Agricultural Internal Combustion Equipment to Electric Service." Applications 04-11-007 and 04-11-008 filed November 9, 2004). PUC Decision 05-06-016. June 16, 2006.

SCAQMD, 2005. South Coast Air Quality Management District. Rule 1110.2 Emissions From Gaseous- and Liquid-Fueled Engines. Diamond Bar, California. June 3, 2005.

SJVUAPCD, 2005. San Joaquin Valley Unified Air Pollution Control District. Draft Staff Report. District Rule 2250 (Stationary Equipment Registration) District Rule 3155 (Stationary Equipment Registration Fees). Fresno, California (Headquarters). December 13, 2005.

SJVUAPCD, 2006. San Joaquin Valley Unified Air Pollution Control District. Rule 4702 Internal Combustion Engines - Phase 2. Fresno, California (Headquarters). April 20, 2006.

Thesen, 2006. Personal Communication Sven Thesen, Pacific Gas and Electric to Barbara Cook, California Air Resources Board. May 2006.

U.S. Census Bureau, 2002. United States Census Bureau. Economic Census 2002 Report – Industry Series Definition: NAICS 811310 Commercial and Industrial Machinery and Equipment (except automotive and electronic) Repair and Maintenance. http://www.census.gov/econ/census02/data/industry/E811310.HTM#def September 12, 2006.

USDA, 2002a. United States Department of Agriculture National Agricultural Statistics Service. 2002 Census of Agriculture. Volume 1, Chapter 2: California County Level Data, Table 31. http://www.nass.usda.gov/census/census02/volume1/ca/index2.htm. January 5, 2006.

USDA, 2002b. United States Department of Agriculture National Agricultural Statistics Service. 2002 Census of Agriculture: Farm and Ranch Irrigation Survey (2003). Volume 3, Special Studies, Part 1. November 2004.

Appendix A

Proposed Amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines

AIRBORNE TOXIC CONTROL MEASURE FOR STATIONARY COMPRESSION IGNITION ENGINES

Note: The preliminary draft amendments are shown in underline to indicate additions to, and ~~strikethrough~~ to indicate deletions from, the existing regulatory text.

Section 93115. Airborne Toxic Control Measure for Stationary Compression Ignition (CI) Engines.

~~(a) Purpose~~*93115.1 Purpose*

The purpose of this airborne toxic control measure (ATCM) is to reduce diesel particulate matter (PM) and criteria pollutant emissions from stationary diesel-fueled compression ignition (CI) engines.

~~(b) Applicability~~*93115.2 Applicability*

(~~1~~a) Except as provided in ~~sub~~section ~~(c)~~93115.3, this ~~section~~ATCM applies to any person who either sells a stationary CI engine, offers a stationary CI engine for sale, leases a stationary CI engine, or purchases a stationary CI engine for use in California~~.~~, unless such engine is:

(1) a portable CI engine,
(2) a CI engine used to provide motive power,
(3) an auxiliary CI engine used on a marine vessel, or
(4) an agricultural wind machine as defined in section 93115.4(b).

(~~2~~b) Except as provided in ~~sub~~sections ~~(c)~~93115.3 and 93115.9, this ~~section~~ATCM applies to any person who owns or operates a stationary CI engine in California with a rated brake horsepower greater than 50 (>50 bhp).

~~(3) No later than 120 days after the approval of this section by the Office of Administrative Law, each air pollution control and air quality management district (district) shall:~~
~~(A) implement and enforce the requirements of this section; or~~
~~(B) propose its own ATCM to reduce diesel PM from stationary diesel-fueled CI engines as provided in Health and Safety Code section 39666(d).~~

~~(c) Exemptions~~*93115.3 Exemptions*

~~(1) The requirements of this section do not apply to portable CI engines or CI engines used to provide the motive power for on-road and off-road vehicles.~~

~~(2) The requirements of this section do not apply to CI engines used for the propulsion of marine vessels or auxiliary CI engines used on marine vessels.~~

(~~3~~a)The in-use stationary diesel agricultural emission standard and other requirements of ~~this~~ section 93115.8(b) do not apply to ~~in-use stationary CI engines used in agricultural operations.~~ agricultural emergency standby generator set engines or remotely-located agricultural engines provided:

(1) the engines are equipped with nonresettable hour meters with a minimum display capability of 9,999 hours; and

(2) the owners or operators of such engines comply with the registration requirements of section 93115.8(c) and (d) and the recordkeeping and reporting requirements of section 93115.10(d) and (f).

(4b)The requirements specified in ~~sub~~sections ~~(e)(2)(A), (e)(2)(C), and (e)(4)(A)~~ 93115.6, 93115.7, and 93115.10(a) do not apply to new or in-use stationary diesel-fueled CI engines used in agricultural operations.

(~~5~~c)The requirements specified in ~~sub~~section ~~(e)(3)~~93115.9 do not apply to single cylinder cetane test engines used exclusively to determine the cetane number of diesel fuels in accordance with American Society for Testing and Materials (ASTM) Standard D 613-03b, "Standard Test Method for Cetane Number of Diesel Fuel Oil," as modified on June 10, 2003, which is incorporated herein by reference.

(~~6~~d)The requirements specified in ~~sub~~sections ~~(e)(2)(B)3. and (e)(2)(D)1.~~93115.6(b)(3) and 93115.7(b)(1) do not apply to in-use stationary diesel-fueled CI engines used in emergency standby or prime applications that, prior to January 1, 2005, were required in writing by the district to meet and comply with either minimum technology requirements or performance standards implemented by the district from the "Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines," October 2000, which is incorporated herein by reference.

(~~7~~e)The requirements specified in ~~sub~~section ~~(e)(2)(B)3.~~93115.6(b)(3) do not apply to permitted in-use stationary emergency standby diesel-fueled CI engines that will be removed from service or replaced prior to January 1, 2009, in accordance with an approved Office of Statewide Health Planning Development (OSHPD) Compliance Plan that has been approved prior to January 1, 2009, except that this exemption does not apply to replacement engines for the engines that are removed from service under the OSHPD plan.

(~~8~~f) The requirements in ~~sub~~sections ~~(e)(1), (e)(2)(C), and (e)(2)(D)~~93115.5 and 93115.7 do not apply to any stationary diesel-fueled CI engine used solely for the training and testing of United States Department of Defense (U.S. DoD) students or personnel of any U.S. military branch in the operation, maintenance, repair and rebuilding of engines when such training engines are required to be configured and designed similarly to counterpart engines used by the U.S. DoD, U.S. Military services or North Atlantic Treaty Organization (NATO) forces in combat, combat support, combat service support, tactical or relief operations used on land or at sea.

(~~9~~g)The requirements specified in ~~sub~~sections ~~(e)(1) and (e)(2)~~93115.5 through 93115.8 do not apply to stationary diesel-fueled CI engines used solely on San Nicolas or San Clemente Islands. The Ventura County Air Pollution Control District Air Pollution Control Officer (APCO) and the South Coast Air Quality Management District APCO shall review the land use plans for the island in their jurisdiction at least once every five (5) years and withdraw this exemption if the land use plans are changed to allow use by the general public of the islands.

(~~10~~h)The requirements specified in ~~sub~~sections ~~(e)(2)~~ 93115.6 and 93115.7 do not apply to stationary diesel-fueled engines used solely on outer continental shelf (OCS) platforms located within 25 miles of California's seaward boundary.

(~~11~~i)Exemption for Emergency Engines at Nuclear Facilities. The requirements in ~~sub~~section ~~(e)(2)(B)3.~~93115.6(b)(3) do not apply to any in-use stationary diesel-fueled CI engines for which all of the following criteria are met:

(~~A~~1) the engine is an emergency standby engine;

(~~B~~2) the engine is subject to the requirements of the U.S. Nuclear Regulatory Commission;

(~~C~~3) the engine is used solely for the safe shutdown and maintenance of a nuclear facility when normal power service fails or is lost; and

(~~D~~4) the engine undergoes maintenance and testing operations for no more than 200 hours cumulatively per calendar year.

(~~12~~j)Request for Exemption for Low-Use Prime Engines Outside of School Boundaries. The district APCO may approve a Request for Exemption from the provisions of ~~sub~~section ~~(e)(2)(D)1.~~93115.7(b)(1) for any in-use stationary diesel-fueled CI engine located beyond school boundaries, provided the approval is in writing, and the writing specifies all of the following conditions to be met by the owner or operator:

(~~A~~1) the engine is a prime engine;

(~~B~~2) the engine is located more than 500 feet from a school at all times;

(~~C~~3) the engine operates no more than 20 hours cumulatively per year. The district APCO may use a different number of hours for applying this exemption if the diesel-fueled CI engine is used solely to start a combustion gas turbine engine, provided the number of hours used for this exemption is justified by the district, on a case-by-case basis, with consideration of factors including, at a minimum, the operational requirements of a facility using a combustion gas turbine engine and the impacts of the emissions from the engine at any receptor location.

(~~13~~k)The requirements in ~~sub~~sections ~~(e)(2)(B)3. and (e)(2)(D)1.~~93115.6(b)(3), 93115.7(b)(1), and 93115.8(b)(1) through (3) do not apply to in-use dual-fueled diesel pilot CI engines that use an alternative fuel or an alternative diesel fuel.

(~~14~~l)The requirements in ~~sub~~sections ~~(e)(1), (e)(2)(A)3., (e)(2)(B)3., (e)(2)(C)1., and (e)(2)(D)1.~~93115.5, 93115.6(a)(3), 93115.6(b)(3), 93115.7(a)(1), 93115.7(b)(1),

93115.8(a)(1), 93115.8(b)(1) through (3), and 93115.9 do not apply to dual-fueled diesel pilot CI engines that use diesel fuel and digester gas or landfill gas.

(~~15~~m)The requirements in ~~sub~~sections ~~(e)(2)(B)3. and (e)(2)(D)1.~~93115.6(b)(3), 93115.7(b)(1), and 93115.8(b)(1) through (3) do not apply to in-use stationary diesel-fueled CI engines that have selective catalytic reduction systems.

(~~16~~n)The requirements of ~~sub~~section ~~(e)(2)(B)3.~~93115.6(b)(3) do not apply to in-use emergency fire pump assemblies that are driven directly by stationary diesel-fueled CI engines and only operated the number of hours necessary to comply with the testing requirements of National Fire Protection Association (NFPA) 25 "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," ~~1998~~2006 edition or the most current edition approved by the Executive Officer, which is incorporated herein by reference.

(~~17~~o)The requirements of ~~sub~~section ~~(e)(1), (e)(2)(A)3., (e)(2)(B)3., (e)(2)(C), and (e)(2)(D)~~93115.5, 93115.6(a)(3), 93115.6(b)(3), 93115.7(a), and 93115.7(b) do not apply to any stationary diesel-fueled CI engine used to power equipment that is owned by the National Aeronautics and Space Administration (NASA) and used solely at manned-space flight facilities including launch, tracking, and landing sites, provided the District APCO approves this exemption in writing. This exemption only applies to diesel engines that power equipment which is maintained in the same configuration as similar equipment at all manned space flight facilities.

(~~18~~p)Request for Delay in Implementation for Remotely Located In-Use Prime Engines. Prior to January 1, 2011, the district APCO may approve a Request for Delay in Implementation from the provisions of ~~(e)(2)(D)1.~~93115.7(b)(1) until January 1, 2011, for any in-use stationary diesel-fueled CI engine, provided the approval is in writing, and the writing specifies all the following conditions to be met by the owner or operator:

(~~A~~1) the engine is a prime engine, and

(~~B~~2) the engine is located more than one mile from any receptor location, and

(~~C~~3) the impacts of the emissions from the engine at any receptor location result in:

~~1.~~(A) a prioritization score of less than 1.0; and

~~2.~~(B) a maximum cancer risk of less than 1 in a million; and

~~3.~~(C) a maximum Hazard Index Value of less than 0.1.

(~~19~~q)Request for Delay in Implementation of Fuel Requirements. Prior to January 1, 2006, the district may approve a Request for Delay in implementation from the provisions of ~~(e)(1)~~ 93115.5 until a date as determined by the district, for any new or in-use stationary diesel-fueled CI engine, provided the approval is in writing, and the writing specifies the following information:

(1.) the engine is a new stationary CI engine or an in-use stationary diesel-fueled CI engine, and

(2.) the engine's fuel consumption rate, and

(3.) the identification of the fuel in the fuel tank at the time of approval, and

(4.) the specification of the fuel in the fuel tank at the time of approval; and

(5.) the amount of fuel in the fuel tank at the time of approval; and
(6.) the anticipated number of hours per year the engine is planned to be operated; and
(7.) the date when compliance with the fuel use requirements specified in subsection (e)(1) 93115.5 is required.

(20r)The operational restrictions in subsections (e)(2)(A)1. and (e)(2)(B)2. 93115.6(a)(1) and 93115.6(b)(2) for engines located at or near school grounds do not apply to engines located at or near school grounds that also serve as the students' place of residence, e.g. boarding schools.

(s) The District may exempt any stock engine from the new stationary diesel-fueled engine emission standards in sections 93115.6(a), 93115.7(a), 93115.8(a), and 93115.9 provided the seller and the owner or operator demonstrate to the District's satisfaction that the following conditions are met:

(1) Seller: Any stationary diesel-fueled engine greater than 50 bhp shall meet the following standards and conditions:
  (A) The stationary diesel-fueled engine emission standards in sections 93115.6(b), 93115.7(b), or 93115.8(b), or
  (B) The Off-Road CI Engine Certification Standards (title 13, CCR, section 2423) immediately preceding the transition to new standards for an off-road CI engine of the same model year and maximum rated power, and
  (C) The engine was delivered to California no more than twelve months immediately preceding the transition to new standards for an off-road CI engine of the same model year and maximum rated power, and
  (D) The engine was sold no later than six months after the effective date of the new standards for an off-road CI engine of the same model year and maximum rated power,.
(2) Owner/operator:
  (A) The date of acquisition of the stock engine is no later than six months from the date an emission standard applicable to new engines becomes more stringent than the emission standard to which the stock engine is certified.
  (B) The date the District determines the application is complete for an Authority to Construct permit is no later than six months after the date of acquisition of the stock engine.

(t) The requirements of section 93115.6(b)(3) do not apply to any stationary diesel-fueled emergency standby engine primarily used by the United States Department of Defense located at Command Destruct (CT) sites until December 31, 2009. Each stationary diesel-fueled emergency standby engine at a CT site will be allowed a maximum of 100 total annual hours of operation for maintenance and testing.

(u) Upon the prior written approval of the APCO, the requirements of this ATCM do not apply to stationary CI engines used exclusively:

(1) as engine test cells and test stands used for testing burners or CI engines;
(2) for operation or performance testing of fuels, fuel additives, or emission control devices at research and development facilities; or
(3) for maintenance, repair, or rebuild training at educational facilities.

~~(d) Definitions~~*93115.4 Definitions*

For purposes of this ~~section~~ATCM, the following definitions apply:

(~~1~~a)"Agricultural Operations" means the growing and harvesting of crops or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution. Agricultural operations do not include activities involving the processing or distribution of crops or fowl.

(b) "Agricultural Wind Machine" means a stationary CI engine-powered fan used exclusively in agricultural operations to provide protection to crops during cold weather by mixing warmer atmospheric air with the colder air surrounding a crop.

(~~2~~c)"Air Pollution Control Officer (APCO)" means the person appointed pursuant to section 40750 of the Health and Safety Code~~Executive Officer or director of a district~~, or his or her designated representative.

(~~3~~d)"Alternative Fuel" means natural gas, propane, ethanol, or methanol.

(~~4~~e)"Alternative Diesel Fuel" means any fuel used in a CI engine that is not commonly or commercially known, sold, or represented by the supplier as diesel fuel No. 1-D or No. 2-D, pursuant to the specifications in ASTM D 975-81, "Standard Specification for Diesel Fuel Oils," as modified in May 1982, which is incorporated herein by reference, or an alternative fuel, and does not require engine or fuel system modifications for the engine to operate, although minor modifications (e.g., recalibration of the engine fuel control) may enhance performance. Examples of alternative diesel fuels include, but are not limited to, biodiesel and biodiesel blends that do not meet the definition of CARB diesel fuel; Fischer-Tropsch fuels; emulsions of water in diesel fuel; and fuels with a fuel additive, unless:

(~~A~~1) the additive is supplied to the engine fuel by an on-board dosing mechanism, or
(~~B~~2) the additive is directly mixed into the base fuel inside the fuel tank of the engine, or
(~~C~~3) the additive and base fuel are not mixed until engine fueling commences, and no more additive plus base fuel combination is mixed than required for a single fueling of a single engine.

(~~5~~f) "Approach Light System with Sequenced Flasher Lights in Category 1 and Category 2 Configurations (ALSF-1 and ALSF-2)" means high intensity approach

lighting systems with sequenced flashers used at airports to illuminate specified runways during category II or III weather conditions, where category II means a decision height of 100 feet and runway visual range of 1,200 feet, and category III means no decision height or decision height below 100 feet and runway visual range of 700 feet.

(~~6~~g)"Baseline" or "Baseline Emissions" means the emissions level of a diesel-fueled engine using CARB diesel fuel as configured upon initial installation or by January 1, 2003, whichever is later.

(~~7~~h)"California Air Resources Board (CARB) Diesel Fuel" means any diesel fuel that meets ~~is commonly or commercially known, sold, or represented by the supplier as diesel fuel No. 1-D or No. 2-D, pursuant to~~ the specifications of vehicular diesel fuel, as defined in ~~ASTM D975-81, "Standard Specification for Diesel Fuel Oils," as modified in May 1982, which is incorporated herein by reference, and that meets the specifications defined in~~ title 13, CCR, sections 2281~~,~~ and 2282~~, and 2284~~.

(~~8~~i) "Cancer Risk" means the characterization of the probability of developing cancer from exposure to environmental chemical hazards, in accordance with the methodologies specified in "The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," Office of Environmental Health Hazard Assessment, August 2003, which is incorporated herein by reference.

(~~9~~j) "Carbon Monoxide (CO)" is a colorless, odorless gas resulting from the incomplete combustion of hydrocarbon fuels.

(k) "Certified Engine" means a CI engine that is certified to meet the Tier 1, Tier 2, Tier 3, or Tier 4 Off-Road CI Certification Standards as specified in title 13, California Code of Regulations, section 2423.

(~~10~~l)"Combustion Gas Turbine Engine" means an internal combustion gas or liquid-fueled device consisting of compressor, combustor, and power turbine used to power an electrical generator.

(~~11~~m)"Compression Ignition (CI) Engine" means an internal combustion engine with operating characteristics significantly similar to the theoretical diesel combustion cycle. The regulation of power by controlling fuel supply in lieu of a throttle is indicative of a compression ignition engine.

(~~12~~n)"Control Area" means any electrical region in California that regulates its power generation in order to balance electrical loads and maintain planned interchange schedules with other control areas.

(~~13~~o)"Cumulatively" means the aggregation of hours or days of engine use, and any portion of an hour or day of engine use, toward a specified time limit(s).

(~~13.5~~p) "Date of Acquisition or Submittal" means

(~~A~~1) For each District-approved permit or district registration for stationary sources, the date the application for the district permit or the application for engine registration was submitted to the District. Alternatively, upon District approval, the date of purchase as defined by the date shown on the front of the cashed check, the date of the financial transaction, or the date on the engine purchasing agreement, whichever is earliest.

(~~B~~2) For an engine subject to neither a district permit program nor a district registration program for stationary sources, the date of purchase as defined by the date shown on the front of the cashed check, the date of the financial transaction, or the date on the engine purchasing agreement, whichever is earliest.

(q) "Date of Initial Installation" means one of the following, whichever is earlier:

a. the date on which a new stationary diesel-fueled engine is placed at a location in order to be operated for the first time since delivery from the manufacturer or distributor, or,

b. for the purposes of a Tier 1- or Tier 2-certified stationary diesel agricultural engine complying with section 93115.8(b)(3) emission standards, one year from January 1 of the model year of such engine.

(~~14~~r)"Demand Response Program (DRP)" means a program for reducing electrical demand using an Interruptible Service Contract (ISC) or Rolling Blackout Reduction Program (RBRP).

(~~15~~s)"Diesel Fuel" means any fuel that is commonly or commercially known, sold, or represented by the supplier as diesel fuel, including any mixture of primarily liquid hydrocarbons - organic compounds consisting exclusively of the elements carbon and hydrogen - that is sold or represented by the supplier as suitable for use in an internal combustion, compression-ignition engine.

(~~16~~t)"Diesel-Fueled" means fueled by diesel fuel, CARB diesel fuel, or jet fuel, in whole or part.

(~~17~~u)"Diesel Particulate Filter (DPF)" means an emission control technology that reduces PM emissions by trapping the particles in a flow filter substrate and periodically removes the collected particles by either physical action or by oxidizing (burning off) the particles in a process called regeneration.

(~~18~~v)"Diesel Particulate Matter (PM)" means the particles found in the exhaust of diesel-fueled CI engines as determined in accordance with the test methods identified in ~~sub~~section ~~(i)~~93115.14.

(~~19~~w)"Digester Gas" is any gas derived from anaerobic decomposition of organic matter.

(~~19.5~~x) "Direct-Drive Emergency Standby Fire Pump Engines" means engines directly coupled to pumps exclusively used in water-based fire protection systems.

(~~20~~y)"District" has the same meaning as defined in the California Health and Safety Code, Section 39025.

(~~21~~z)"DRP Engine" means an engine that is enrolled in a DRP.

(~~22~~aa)"Dual-fuel Diesel Pilot Engine" means a dual-fueled engine that uses diesel fuel as a pilot ignition source at an annual average ratio of less than 5 parts diesel fuel to 100 parts total fuel on an energy equivalent basis.

(~~23~~bb)"Dual-fuel Engine" means any CI engine that is engineered and designed to operate on a combination of alternative fuels, such as compressed natural gas (CNG) or liquefied petroleum gas (LPG) and diesel fuel or an alternative diesel fuel. These engines have two separate fuel systems, which inject both fuels simultaneously into the engine combustion chamber.

(~~24~~cc)"Emergency Standby Engine" means a stationary engine that meets the criteria specified in (~~A~~1) and (~~B~~2) and any combination of (~~C~~3) or (~~D~~4) or (~~E~~5) below:

(~~A~~1) is installed for the primary purpose of providing electrical power or mechanical work during an emergency use and is not the source of primary power at the facility; and

(~~B~~2) is operated to provide electrical power or mechanical work during an emergency use; and

(~~C~~3) is operated under limited circumstances for maintenance and testing, emissions testing, or initial start-up testing, as specified in ~~sub~~sections ~~(e)(2)(A), (e)(2)(B), and (e)(2)(F)~~93115.6(a),(b), and (c); or

(~~D~~4) is operated under limited circumstances in response to an impending outage, as specified in ~~sub~~sections ~~(e)(2)(A), (e)(2)(B), and (e)(2)(F)~~93115.6(a),(b), and (c); or

(~~E~~5) is operated under limited circumstances under a DRP as specified in ~~sub~~section ~~(e)(2)(F)~~93115.6(c).

(~~25~~dd)"Emergency Use" means providing electrical power or mechanical work during any of the following events and subject to the following conditions:

(~~A~~1) the failure or loss of all or part of normal electrical power service or normal natural gas supply to the facility:

~~1.~~(A) which is caused by any reason other than the enforcement of a contractual obligation the owner or operator has with a third party or any other party; and

~~2.~~(B) which is demonstrated by the owner or operator to the district APCO's satisfaction to have been beyond the reasonable control of the owner or operator;

(~~B~~2) the failure of a facility's internal power distribution system:

~~1.~~(A) which is caused by any reason other than the enforcement of a contractual obligation the owner or operator has with a third party or any other party; and

~~2.~~(B) which is demonstrated by the owner or operator to the district APCO's satisfaction to have been beyond the reasonable control of the owner or operator;

(~~C~~3) the pumping of water or sewage to prevent or mitigate a flood or sewage overflow;

(~~D~~4) the pumping of water for fire suppression or protection;

(~~E~~5) the powering of ALSF-1 and ALSF-2 airport runway lights under category II or III weather conditions;

(~~F~~6) the pumping of water to maintain pressure in the water distribution system for the following reasons:

~~1.~~(A) a pipe break that substantially reduces water pressure; or

~~2.~~(B) high demand on the water supply system due to high use of water for fire suppression; or

~~3.~~(C) the breakdown of electric-powered pumping equipment at sewage treatment facilities or water delivery facilities~~.~~; or

(~~G~~7) the day-of-launch system checks and ~~initial~~ launch tracking performed (in parallel with grid power) by~~of~~ the United States Department of Defense at Command Destruct sites (also known as "CT" sites) that occur within the 24-hour time period associated with the scheduled time of the launch ~~flight hardware (in parallel with grid power) where the loss of normal power would cause damage to or loss of government facilities and/or flight hardware.~~

(~~26~~ee)"Emission Control Strategy" means any device, system, or strategy employed with a diesel-fueled CI engine that is intended to reduce emissions including, but not limited to, particulate filters, diesel oxidation catalysts, selective catalytic reduction systems, fuel additives used in combination with particulate filters, alternative diesel fuels, and any combination of the above.

(~~27~~ff)"End User" means any person who purchases or leases a stationary diesel-fueled engine for operation in California. Persons purchasing engines for the sole purpose of resale are not considered "end users."

(~~28~~gg)"Enrolled" means either of the following, whichever applies:

(A1) the ISC is in effect during the specified time period for an engine in an ISC; or

(~~B~~2) the date the engine is entered into the RBRP.

(~~29~~hh)"Executive Officer" means the executive officer of the Air Resources Board, or his or her designated representative.

(~~30~~ii)"Facility" means one or more contiguous properties, in actual physical contact or separated solely by a public roadway or other public right-of-way, under common ownership on which engines operate.

(~~31~~jj)"Fuel Additive" means any substance designed to be added to fuel or fuel systems or other engine-related engine systems such that it is present in-cylinder during combustion and has any of the following effects: decreased emissions, improved fuel economy, increased performance of the engine; or assists diesel emission control strategies in decreasing emissions, or improving fuel economy or increasing performance of the engine.

(~~32~~kk)"Generator Set" means a CI engine coupled to a generator that is used as a source of electricity.

(~~33~~ll)"Hazard Index" means the sum of individual acute or chronic hazard quotients for each substance affecting a particular toxicological endpoint, as determined in accordance with the requirements of "The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments," Office of Environmental Health Hazard Assessment, August 2003, which is incorporated herein by reference.

(~~34~~mm) "HC" means the sum of all hydrocarbon air pollutants.

(~~34.5~~nn) "Health Facility" has the same meaning as defined in Section 1250 of the California Health and Safety Code.

(~~35~~oo)"In-Use" means a CI engine that is not a "new" CI engine.

(~~36~~pp)"Initial Start-up Testing" means operating the engine or supported equipment to ensure their proper performance either:

(~~A~~1) for the first time after installation of a stationary diesel-fueled CI engine at a facility, or

(~~B~~2) for the first time after installation of emission control equipment on an in-use stationary diesel-fueled CI engine.

(~~37~~qq)"Interruptible Service Contract (ISC)" means a contractual arrangement in which a utility distribution company provides lower energy costs to a nonresidential electrical customer in exchange for the ability to reduce or interrupt the customer's electrical service during a Stage 2 or Stage 3 alert, or during a transmission emergency.

(~~38~~rr)"Jet Fuel" means fuel meeting any of the following specifications:

(~~A~~1) ASTM D 1655-02, "Standard Specification for Aviation Turbine Fuels," which is incorporated herein by reference. Jet fuels meeting this specification include Jet A, Jet A-1, and Jet B;

(~~B~~2) Military Detail (MIL-DTL) 5624T, "Turbine Fuels, Aviation, Grades Jet Propellant (JP) JP-4, JP-5, and JP-5/JP8 ST," dated September 18, 1998, which is incorporated herein by reference; and

(~~C~~3) Military Test (MIL-T) 83133E, "Turbine Fuels, Aviation, Kerosene Types, North Atlantic Treaty Organization (NATO) F-34 (JP-8), NATO F-35, and JP-8+100," dated April 1, 1999, which is incorporated herein by reference.

(~~39~~ss)"Landfill Gas" means any gas derived through any biological process from the decomposition of waste buried within a waste disposal site.

(~~40~~tt)"Location" means any single site at a facility.

(~~41~~uu)"Maintenance and Testing" means operating an emergency standby CI engine to:

(~~A~~1) evaluate the ability of the engine or its supported equipment to perform during an emergency. "Supported Equipment" includes, but is not limited to, generators, pumps, transformers, switchgear, and breakers; or

(~~B~~2) facilitate the training of personnel on emergency activities; or

(~~C~~3) provide electric power for the facility when the utility distribution company takes its power distribution equipment offline to service that equipment for any reason that does not qualify as an emergency use; or

(4) provide additional hours of operation to perform testing on an engine that has experienced a breakdown or failure during maintenance. Upon air district approval, these additional hours of operation will not be counted in the maximum allowable annual hours of operation for the emergency standby CI engine that provided the electrical power.

(~~42~~vv)"Maximum Rated Power" means the maximum brake kilowatt output of an engine as determined from any of the following, whichever is the greatest:

(~~A~~1) the manufacturer's sales and service literature,

(~~B~~2) the nameplate of the unit, or

(~~C~~3) if applicable, as shown in the application for certification of the engine.

(~~43~~ww)"Model Year" means the stationary CI engine manufacturer's annual production period, which includes January 1st of a calendar year, or if the manufacturer has no annual production period, the calendar year.

(~~44~~xx)"New" or "New CI Engine" means the following:

(~~A~~1) a stationary CI engine installed at a facility after January 1, 2005, including an engine relocated from an off-site location after January 1, 2005, except the following shall be deemed in-use engines:

~~1.~~(A) a replacement stationary CI engine that is installed to temporarily replace an in-use engine while the in-use engine is undergoing maintenance and testing, provided the replacement engine emits no more than the in-use engine, and the replacement engine is not used more than 180 days cumulatively in any 12-month rolling period;

~~2.~~(B) an engine for which a district-approved application for a district permit or engine registration for stationary sources was submitted to the District prior to January 1, 2005, even though the engine was installed after January 1, 2005;

~~3.~~(C) an engine that is one of four or more engines owned by an owner or operator and is relocated prior to January 1, 2008, to an offsite location that is owned by the same owner or operator;

~~4.~~(D) an engine, or replacement for an engine, ~~installed prior to or on January 1, 2005, in a facility~~ used in agricultural operations that is

~~owned by an owner or operator, which is subsequently~~ relocated within the same facility or to another ~~offsite~~ facility under the same owner or operator for use in agricultural operations, unless the engine is sited where an engine is not currently located and has not been previously located.~~location that is owned by the same owner or operator~~.

~~5.~~(E) an engine installed at a facility prior to January 1, 2005, and relocated within the same facility after January 1, 2005.

~~6.~~(F) a model year 2004 or 2005 engine purchased prior to January 1, 2005, for use in California. The date of purchase is defined by the date shown on the front of the cashed check, the date of the financial transaction, or the date on the engine purchasing agreement, whichever is earliest.

(G) a greater than 50 bhp Tier 1- or Tier 2-certified stationary diesel-fueled CI engine used in agricultural operations installed after January 1, 2005, shall be considered an in-use stationary diesel engine subject to the requirements of section 93115.8(b)(3), provided such engine is still operating 12 years after the date of initial installation.

(~~B~~2) a stationary CI engine that has been reconstructed after January 1, 2005, shall be deemed a new engine unless the sum of the costs of all individual reconstructions of that engine after January 1, 2005, is less than 50% of the lowest-available purchase price, determined at the time of the most recent reconstruction, of a complete, comparably-equipped new engine (within ± 10% of the reconstructed engine's brake horsepower rating).

For purposes of this definition, the cost of reconstruction and the cost of a comparable new engine shall not include the cost of equipment and devices required to meet the requirements of this ATCM.

(~~45~~yy)"Nitrogen Oxides (NOx)" means compounds of nitric oxide (NO), nitrogen dioxide (NO_2), and other oxides of nitrogen, which are typically created during combustion processes and are major contributors to smog formation and acid deposition.

(zz) "Noncertified Engine" means a CI engine that is not certified to meet an Off-Road CI Certification Standards as specified in title 13, California Code of Regulations, section 2423.

(~~46~~aaa) "Non-Methane Hydrocarbons (NMHC)" means the sum of all hydrocarbon air pollutants except methane.

(~~47~~bbb) Outer Continental Shelf (OCS) shall have the meaning provided by section 2 of the Outer Continental Shelf Lands Act (43 U.S.C. Section 1331 et seq.).

(~~48~~ccc) "Owner or Operator" means any person subject to the requirements of this ~~section~~ATCM, including but not limited to:

(A1) an individual, trust, firm, joint stock company, business concern, partnership, limited liability company, association, or corporation including but not limited to, a government corporation; and

(B2) any city, county, district, commission, the state or any department, agency, or political subdivision thereof, any interstate body, and the federal government or any department or agency thereof to the extent permitted by law.

(49ddd) "Particulate Matter (PM)" means the particles found in the exhaust of CI engines, which may agglomerate and adsorb other species to form structures of complex physical and chemical properties.

(50eee) "Portable CI Engine" means a compression ignition (CI) engine designed and capable of being carried or moved from one location to another, except as provided in subsection (d)(63)93115.4(ttt). Indicators of portability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform. The provisions of this definition notwithstanding, an engine with indicators of portability that remains at the same facility location for more than 12 consecutive rolling months or 365 rolling days, whichever occurs first, not including time spent in a storage facility, shall be deemed a stationary engine.

(51fff)"Prime CI Engine" means a stationary CI engine that is not an emergency standby CI engine.

(52ggg) "Prioritization Score" means the numeric value used to rank facilities in order of their potential to pose significant risk to human receptors. Prioritization scores are calculated per the process described in the "CAPCOA Air Toxics 'Hot Spots' Program Facility Prioritization Guidelines," California Air Pollution Control Officer's Association (CAPCOA), July 1990, which is incorporated herein by reference.

(53hhh) "Rated Brake Horsepower (bhp)" means:

(A1) for in-use engines, the maximum brake horsepower output of an engine as determined from any of the following, whichever reflects the engine's configuration as of January 1, 2005:

1.(A) the manufacturer's sales and service literature;

2.(B) the nameplate of the engine; or

3.(C) if applicable, as shown in the application for certification of the engine;

(B2) for new engines, the maximum brake horsepower output of an engine as determined from any of the following, whichever reflects the engine's configuration upon the engine's initial installation at the facility:

1.(A) the manufacturer's sales and service literature;

2.(B) the nameplate of the engine; or

3.(C) if applicable, as shown in the application for certification of the engine.

(54iii)"Receptor location" means any location outside the boundaries of a facility where a person may experience exposure to diesel exhaust due to the operation of a

stationary diesel-fueled CI engine. Receptor locations include, but are not limited to, residences, businesses, hospitals, daycare centers, and schools.

(~~55~~jjj)"Reconstruction" means the rebuilding of the engine or the replacement of engine parts, including pollution control devices, but excluding operating fluids; lubricants; and other consumables such as air filters, fuel filters, and glow plugs that are subject to regular replacement.

(kkk) "Remotely-Located Agricultural Engine" means a stationary diesel-fueled CI engine used in agriculture that is:

(1) located in a federal ambient air quality area that is designated as attainment for all PM and ozone national ambient air quality standards (title 40, Code of Federal Regulations, section 81.305 et seq.); and
(2) located more than one-half mile from any receptor location; and
(3) operated no more than 200 hours annually if the engine is a noncertified or Tier 1-certified engine; or
(4) operated no more than 600 hours annually if the engine is a Tier 2-, Tier 3-, or interim Tier 4-certified engine.

(lll) "Residential Area" means three or more permanent residences (i.e., homes) located anywhere outside the facility's property.

(~~56~~mmm)"Rolling Blackout Reduction Program (RBRP)" means a contractual arrangement, implemented by the San Diego Gas and Electric Company (SDG&E) in San Diego County, in which SDG&E pays a nonresidential electrical customer, in the most current RBRP Schedule ~~$0.20 per kW-hr of reduced demand~~ in exchange for the customer using its diesel-fueled engines to reduce its electrical demand upon request by SDG&E ~~by 15% or more, with a minimum of 100 kW reduction,~~during either a Stage 3 alert or a transmission emergency.

(~~57~~nnn)"Rotating Outage" means a controlled, involuntary curtailment of electrical power service to consumers as ordered by the Utility Distribution Company.

(~~58~~ooo)"School" or "School Grounds" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property.

(~~59~~ppp) "Selective Catalytic Reduction (SCR) System" means an emission control system that reduces NOx emissions through the catalytic reduction of NOx in diesel exhaust by injecting nitrogen-containing compounds into the exhaust stream, such as ammonia or urea.

(~~60~~qqq) "Seller" means any person who sells, leases, or offers for sale any stationary diesel-fueled engine directly to end users.

(~~61~~rrr) "Stage 2 Alert" means an official forecast or declaration by the California Independent System Operator that the operating reserves of electrical power will fall or have fallen below 5 percent.

(~~62~~sss) "Stage 3 Alert" means an official forecast or declaration by the California Independent System Operator that the operating reserves of electrical power will fall or have fallen below 1.5 percent.

(~~63~~ttt)"Stationary CI Engine" means a CI engine that is designed to stay in one location, or remains in one location. A CI engine is stationary if any of the following are true:

(~~A~~1) the engine or its replacement is attached to a foundation, or if not so attached, resides at the same location for more than 12 consecutive months. Any engine such as backup or standby engines, that replaces an engine at a location and is intended to perform the same or similar function as the engine(s) being replaced, shall be included in calculating the consecutive time period. The cumulative time of all engine(s), including the time between the removal of the original engine(s) and installation of the replacement engine(s), will be counted toward the consecutive time period; or

(~~B~~2) the engine remains or will reside at a location for less than 12 consecutive months if the engine is located at a seasonal source and operates during the full annual operating period of the seasonal source, where a seasonal source is a stationary source that remains in a single location on a permanent basis (at least two years) and that operates at that single location at least three months each year; or

(~~C~~3) the engine is moved from one location to another in an attempt to circumvent the 12 month residence time requirement. The period during which the engine is maintained at a storage facility shall be excluded from the residency time determination.

(~~64~~uuu)"Stationary Source" means any building, structure, facility, or installation that emits any pollutant directly or as fugitive emissions. Building, structure, facility, or installation include all pollutant emitting activities which:

(~~A~~1) are under the same ownership or operation, or which are owned or operated by entities which are under common control; and

(~~B~~2) belong to the same industrial grouping either by virtue of falling within the same two-digit standard industrial code or by virtue of being part of a common industrial process, manufacturing process, or connected process involving a common raw material; and

(~~C~~3) are located on one or more contiguous or adjacent properties.

(vvv) "Stock Engine" means a certified CI engine that has never been placed in service and is part of a supply of engines offered for sale, rent, or lease by a person or firm who offers for sale, rent, or lease engines and related equipment for profit.

(~~65~~www) "Transmission Constrained Area" means the specific location that is subject to localized operating reserve deficiencies due to the failure of the normal electrical power distribution system.

(~~66~~xxx) "Transmission Emergency" means an official forecast or declaration by the California Independent System Operator that the available electrical power transmission capacity to a transmission constrained area is insufficient and may result in an uncontrolled local grid collapse in the transmission constrained area.

(~~67~~yyy)"Utility Distribution Company" means one of several organizations that control energy transmission and distribution in California. Utility Distribution Companies include, but are not limited to, the Pacific Gas and Electric Company, the San Diego Gas and Electric Company, Southern California Edison, Los Angeles Department of Water and Power, the Imperial Irrigation District, and the Sacramento Municipal Utility District.

(~~68~~zzz) "Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emissions from Diesel Engines (Verification Procedure)" means the ARB regulatory procedure codified in title 13, CCR, sections 2700-2710, which is incorporated herein by reference, that engine manufacturers, sellers, owners, or operators may use to verify the reductions of diesel PM or NOx from in-use diesel engines using a particular emission control strategy.

(~~69~~aaaa) "Verified Diesel Emission Control Strategy" means an emission control strategy, designed primarily for the reduction of diesel PM emissions, which has been verified pursuant to the "Verification Procedure for In-Use Strategies to Control Emissions from Diesel Engines" in Title 13, California Code of Regulations, commencing with Section 2700.

~~(e) Requirements~~

~~(1) Fuel and Fuel Additive Requirements for New and In-Use Stationary CI Engines That Have a Rated Brake Horsepower of Greater than 50 (>50 bhp)~~
93115.5 Fuel and Fuel Additive Requirements for New and In-Use Stationary CI Engines That Have a Rated Brake Horsepower of Greater than 50 (>50 bhp)

(A~~a~~)As of January 1, 2006, except as provided for in ~~sub~~sections ~~(c)~~93115.3 and 93115.5(c), no owner or operator of a new stationary CI engine or an in-use prime stationary diesel-fueled CI engine shall fuel the engine with any fuel unless the fuel is one of the following:

~~1.~~(1) CARB Diesel Fuel~~,~~; or

~~2.~~(2) an alternative diesel fuel that ~~meets the requirements of the Verification Procedure~~is:

(A) biodiesel;

(B) a biodiesel blend that does not meet the definition of CARB Diesel Fuel;

(C) a Fischer-Tropsch fuel; or
(D) an emulsion of water in diesel fuel~~,~~; or

(3) any alternative diesel fuel that is not identified in section 93115.5(a)(2) above and meets the requirements of the Verification Procedure; or

~~3.~~(4) an alternative fuel~~,~~; or

~~4.~~(5) CARB Diesel Fuel used with fuel additives that meets the requirements of the Verification Procedure~~,~~; or

~~5.~~(6) any combination of ~~(e)(1)(A)1. through (e)(1)(A)4.~~93115.5(a)(1) through (5) above.

(~~B~~b)As of January 1, 2006, except as provided for in ~~sub~~section ~~(c)~~ 93115.3, no owner or operator of an in-use emergency standby stationary diesel-fueled CI engine shall add to the engine or any fuel tank directly attached to the engine any fuel unless the fuel is one of the following:

~~1.~~(1) CARB Diesel Fuel~~,~~; or

~~2.~~(2) an alternative diesel fuel that ~~meets the requirements of the Verification Procedure~~is:
(A) biodiesel;
(B) a biodiesel blend that does not meet the definition of CARB Diesel Fuel;
(C) a Fischer-Tropsch fuel; or
(D) an emulsion of water in diesel fuel~~,~~; or

(3) any alternative diesel fuel that is not identified in section 93115.5(b)(2) above and meets the requirements of the Verification Procedure; or

~~3.~~(4) an alternative fuel~~,~~; or

~~4.~~(5) CARB Diesel Fuel used with fuel additives that meets the requirements of the Verification Procedure~~,~~; or

~~5.~~(6) any combination of ~~(e)(1)(B)1. through (e)(1)(B)4.~~93115.5(b)(1) through (5) above.

(c) Upon the effective date of the amendments to add in-use stationary diesel-fueled agricultural engine requirements to the ATCM, no owner or operator of an in-use stationary diesel-fueled CI engine used in agricultural operations shall fuel the engine with any fuel unless the fuel is one of the following:

(1) CARB Diesel Fuel; or

(2) an alternative diesel fuel that is:
(A) biodiesel;
(B) a biodiesel blend that does not meet the definition of CARB Diesel Fuel;
(C) a Fischer-Tropsch fuel; or
(D) an emulsion of water in diesel fuel; or

(3) any alternative diesel fuel that is not identified in section 93115.5(c)(2) above and meets the requirements of the Verification Procedure; or

(4) an alternative fuel; or

(5) CARB Diesel Fuel used with fuel additives that meets the requirements of the Verification Procedure; or

(6) any combination of 93115.5(c)(1) through (5) above.

~~(2) Operating Requirements and Emission Standards for New and In-Use Stationary Diesel-Fueled CI Engines That Have a Rated Brake Horsepower of Greater than 50 (>50 bhp).~~

93115.6 Emergency Standby Diesel-Fueled CI Engine (>50 bhp) Operating Requirements and Emission Standards

~~(A) New Emergency Standby Diesel-Fueled C/ Engine (>50 bhp) Operating Requirements and Emission Standards~~

(a) New Emergency Standby Diesel-Fueled CI Engine (>50 bhp) Operating Requirements and Emission Standards

~~1.~~(1) At-School and Near-School Provisions. No owner or operator shall operate a new stationary emergency standby diesel-fueled CI engine for non-emergency use, including maintenance and testing, during the following periods:

~~a.~~(A) whenever there is a school sponsored activity, if the engine is located on school grounds, and

~~b.~~(B) between 7:30 a.m. and 3:30 p.m. on days when school is in session, if the engine is located within 500 feet of school grounds. ~~Subs~~Section ~~(e)(2)(A)1.~~ 93115.6(a)(1) does not apply if the engine emits no more than 0.01 g/bhp-hr of diesel PM.

~~2.~~(2) No owner or operator shall operate any new stationary emergency standby diesel-fueled CI engine (>50 bhp) in response to the notification of an impending rotating outage, unless all the following criteria are met:

~~a.~~(A) the engine's permit to operate allows operation of the engine in anticipation of a rotating outage, or the District has established a policy or program that authorizes operation of the engine in anticipation of a rotating outage; and

~~b.~~(B) the Utility Distribution Company has ordered rotating outages in the control area where the engine is located, or has indicated it expects to issue such an order at a specified time; and

~~c.~~(C) the engine is located in a specific location that is subject to the rotating outage; and

~~d.~~(D) the engine is operated no more than 30 minutes prior to the time when the Utility Distribution Company officially forecasts a rotating outage in the control area; and

~~e.~~(F) the engine operation is terminated immediately after the Utility Distribution Company advises that a rotating outage is no longer imminent or in effect.

~~3.~~(3) New Engines: As of January 1, 2005, except as provided in ~~sub~~section ~~(c)~~93115.3, no person shall sell, offer for sale, purchase, or lease for use in California any new stationary emergency standby diesel-fueled CI engine that has a rated brake horsepower greater than 50 unless it meets the following applicable emission standards,

and no person shall operate any new stationary emergency standby diesel-fueled CI engine that has a rated brake horsepower greater than 50, unless it meets all of the following applicable operating requirements and emission standards specified in ~~(e)(2)(A)3.~~ 93115.6(a)(3) (which are summarized in Table 1):

~~a.~~(A) Diesel PM Standard and Hours of Operating Requirements

~~i~~1. General Requirements: New stationary emergency standby diesel-fueled engines (>50 bhp) shall:

~~i~~a. emit diesel PM at a rate less than or equal to 0.15 g/bhp-hr; or

~~ii~~b. meet the diesel PM standard, as specified in the Off-Road Compression Ignition Engine Standards for off-road engines with the same maximum rated power (title 13 CCR, section 2423), in effect on the date of acquisition or submittal, as defined in ~~sub~~section ~~(d)~~93115.4 whichever is more stringent; and

~~iii~~c. not operate more than 50 hours per year for maintenance and testing purposes, except as provided in ~~(e)(2)(A)3.a.II~~ 93115.6(a)(3)(A)2. This subsection does not limit engine operation for emergency use and for emission testing to show compliance with ~~(e)(2)(A)3~~93115.6(a)(3).

~~II~~2. The District may allow a new emergency standby diesel-fueled CI engine (> 50 hp) to operate up to 100 hours per year for maintenance and testing purposes on a site-specific basis, provided the diesel PM emission rate is less than or equal to 0.01 g/bhp-hr. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

TABLE 1: SUMMARY OF THE EMISSION STANDARDS AND OPERATING REQUIREMENTS FOR NEW STATIONARY EMERGENCY STANDBY DIESEL-FUELED CI ENGINES > 50 BHP
(SEE ~~SUB~~SECTION ~~(e)(2)(A)3.~~ 93115.6(a)(3))

DIESEL PM				OTHER POLLUTANTS
DIESEL PM STANDARDS (g/bhp-hr)	MAXIMUM ALLOWABLE ANNUAL HOURS OF OPERATION FOR ENGINES MEETING DIESEL PM STANDARDS			HC, NOx, NMHC+NOx, AND CO STANDARDS (g/bhp-hr)
	Emergency Use	Non-Emergency Use		
		Emission Testing to show Compliance[2]	Maintenance & Testing (hours/year)	
≤0.15[1]	Not Limited by ATCM[3]	Not Limited by ATCM[3]	50	Off-Road CI Engine Certification Standards for an off-road engine of the same model year and horsepower rating, or Tier 1 standards for an off-road engine of maximum rated power.[4]
≤0.01[1]	Not Limited by ATCM[3]	Not Limited by ATCM[3]	51 to 100 (Upon approval by the District)	

1. Or off-road certification standard (title 13 CCR section 2423) for an off-road engine with the same maximum rated power, whichever is more stringent. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.
2. Emission testing limited to testing to show compliance with ~~sub~~sections ~~(e)(2)(A)3~~93115.6(a)(3).
3. May be subject to emission or operational restrictions as defined in current applicable district rules, regulations, or policies.
4. The option to comply with the Tier 1 standards is available only if no off-road engine certification standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary emergency standby diesel-fueled CI engine.

~~b.~~(B) HC, NOx, NMHC + NOx, and CO standards: New stationary emergency standby diesel-fueled CI engines (> 50 bhp) must meet the standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression-~~i~~Ignition Engine Standards (title 13, CCR, section 2423). If no standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary emergency standby diesel-fueled CI engine, then the new stationary emergency standby diesel-fueled CI engine shall meet the Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power, irrespective of the new stationary emergency standby diesel-fueled CI engine's model year.

~~c.~~(C) The District:

~~I~~1. may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate standards; and

~~II~~2. may establish more stringent limits on hours of maintenance and testing on a site-specific basis; and

~~III~~3. shall determine an appropriate limit on the number of hours of operation for demonstrating compliance with other District rules and initial start-up testing.

(4.) New Direct-Drive Emergency Standby Fire Pump Engines: Except as provided in subsection (c)93115.3, no person shall sell, offer for sale, purchase, or lease for use in California any new direct-drive emergency standby diesel-fueled fire-pump engine that has a rated brake horsepower greater than 50 unless it meets either the emission standards of subsection (e)(2)(A)3.93115.6(a)(3) or the emission standards defined in subsection (e)(2)(A)4.93115.6(a)(4), and no person shall operate any new stationary emergency standby diesel-fueled CI engine that has a rated brake horsepower greater than 50, unless it meets all of the applicable operating requirements and emission standards specified in either (e)(2)(A)3.93115.6(a)(3) or (e)(2)(A)493115.6(a)(4).

a.(A) Standards and Hours of Operating Requirements

I1. General Requirements: New direct-drive emergency standby diesel-fueled fire-pump engines (>50 bhp) shall, upon District approval of installation:

ia. meet the Tier 2 emission standards specified in the Off-Road Compression Ignition Engine Standards for off-road engines with the same maximum rated power (title 13 CCR, section 2423) until 3 years after the date the Tier 3 standards are applicable for off-road engines with the same maximum rated power. At that time, new direct-drive emergency standby diesel-fueled fire-pump engines (>50 bhp) are required to meet the Tier 3 emission standards, until 3 years after the date the Tier 4 standards are applicable for off-road engines with the same maximum rated power. At that time, new direct-drive emergency standby diesel-fueled fire-pump engines (>50 bhp) are required to meet the Tier 4 emission standards; and

iib. not operate more than the number of hours necessary to comply with the testing requirements of the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition, which is incorporated herein by reference. This subsection does not limit engine operation for emergency use and for emission testing to show compliance with (e)(2)(A)493115.6(a)(4).

b.(B) The District:

I1. may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate standards; and

II2. may establish more stringent limits on hours of maintenance and testing on a site-specific basis; and

III3. shall determine an appropriate limit on the number of hours of operation for demonstrating compliance with other District rules and initial start-up testing.

~~(B) In-Use Emergency Standby Diesel-Fueled CI Engine (> 50 bhp) Operating Requirements and Emission Standards~~

(b) In-Use Emergency Standby Diesel-Fueled CI Engine (> 50 bhp) Operating Requirements and Emission Standards

~~1.~~(1) No owner or operator shall operate any in-use stationary emergency standby diesel-fueled CI engine in response to the notification of an impending rotating outage unless all the following criteria are met:

~~a.~~(A) the engine's permit to operate allows operation of the engine in anticipation of a rotating outage, or the District has established a policy or program that authorizes operation of the engine in anticipation of a rotating outage; and

~~b.~~(B) the Utility Distribution Company has ordered rotating outages in the control area where the engine is located, or has indicated it expects to issue such an order at a certain time; and

~~c.~~(C) the engine is located in a specific location that is subject to the rotating outage; and

~~d.~~(D) the engine is operated no more than 30 minutes prior to the time when the Utility Distribution Company officially forecasts a rotating outage in the control area; and

~~e.~~(E) the engine operation is terminated immediately after the Utility Distribution Company advises that a rotating outage is no longer imminent or in effect.

~~2.~~(2) At-School and Near-School Provisions. No owner or operator shall operate an in-use stationary emergency standby diesel-fueled CI engine for non-emergency use, including maintenance and testing, during the following periods:

~~a.~~(A) whenever there is a school sponsored activity, if the engine is located on school grounds, and

~~b.~~(B) between 7:30 a.m. and 3:30 p.m. on days when school is in session, if the engine is located within 500 feet of school grounds. ~~Subs~~Section ~~(e)(2)(B)2.~~93115.6(b)(2) does not apply if the engine emits no more than 0.01 g/bhp-hr of diesel PM.

~~3.~~(3) Except as provided in ~~sub~~section ~~(c)~~93115.3, no owner or operator shall operate an in-use stationary emergency standby diesel-fueled CI engine~~s~~ (> 50 hp) in California unless it meets, in accordance with the applicable compliance schedules specified in ~~sub~~sections ~~(f)~~93115.11 and ~~(g)~~93115.12, the following requirements (which are summarized in Table 2):

TABLE 2: SUMMARY OF THE EMISSION STANDARDS AND OPERATING REQUIREMENTS FOR IN-USE STATIONARY EMERGENCY STANDBY DIESEL-FUELED CI ENGINES > 50 BHP
(SEE ~~SUBSECTION (e)(2)(B)3.~~ 93115.6(b)(3))

DIESEL PM				OTHER POLLUTANTS
DIESEL PM STANDARDS (g/bhp-hr)	MAXIMUM ALLOWABLE ANNUAL HOURS OF OPERATION FOR ENGINES MEETING DIESEL PM STANDARDS			HC, NOx, NMHC+NOx, AND CO STANDARDS (g/bhp-hr)
	Emergency Use	Non-Emergency Use		
		Emission Testing to show Compliance[1]	Maintenance & Testing (hours/year)	
>0.40[2]	Not Limited by ATCM[2]	Not Limited by ATCM[2]	20	Not limited by ATCM[2]
>0.15 and ≤0.40	Not Limited by ATCM[2]	Not Limited by ATCM[2]	21 to 30	For engines with emission control strategies not verified through the verification procedure: Off-Road CI Engine Certification Standards for an off-road engine of the same model year and maximum rated power, or Tier 1 standards for an off-road engine of the same maximum rated power.[3] OR Both (i) and (ii) must be met: (i) No increase in HC or NOx above 10% from baseline levels OR No increase in NMHC+NOx emissions above baseline levels (ii) No increase in CO above 10% from baseline levels
>0.01 and ≤0.15	Not Limited by ATCM[2]	Not Limited by ATCM[2]	31 to 50 (Upon approval by the District)	
≤0.01[4]	Not Limited by ATCM[2]	Not Limited by ATCM[2]	51 to 100 (Upon approval by the District)	

1. Emission testing limited to testing to show compliance with ~~subsections (e)(2)(B)3~~93115.6(b)(3).
2. May be subject to emission or operational restrictions as defined in current applicable district rules, regulations, or policies.
3. The option to comply with the Tier 1 standards is available only if no off-road engine certification standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary emergency standby diesel-fueled CI engine.
4. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

~~a.~~(A) Diesel PM Standard and Hours of Operation Limitations

~~1~~1. General Requirements:

~~i~~a. No owner or operator shall operate an in-use stationary emergency standby diesel-fueled CI engine (>50 bhp) that emits diesel PM at a rate greater than 0.40 g/bhp-hr more than 20 hours per year for maintenance and testing purposes. The District may approve up to 20 additional hours per year for the maintenance and testing of such in-use emergency standby

diesel-fueled CI engines operated at health facilities. This subsection does not limit engine operation for emergency use and for emission testing to show compliance with ~~(e)(2)(B)3~~ 93115.6(b)(3).

~~ii~~b. No owner or operator shall operate an in-use stationary emergency standby diesel-fueled CI engine (>50 bhp) that emits diesel PM at a rate less than or equal to 0.40 g/bhp-hr more than 30 hours per year for maintenance and testing purposes, except as provided in ~~(e)(2)(B)3.a.II~~ 93115.6(b)(3)(A)2. This subsection does not limit engine operation for emergency use and for emission testing to show compliance with ~~(e)(2)(B)3~~93115.6(b)(3).

~~II~~2. The District may allow in-use stationary emergency standby diesel-fueled CI engines (> 50 bhp) to operate more than 30 hours per year for maintenance and testing purposes on a site-specific basis, provided the following limits are met:

~~i~~a. Up to 40 annual hours of operation are allowed for maintenance and testing purposes at a health facility if the diesel PM emission rate is greater than 0.15 g/bhp-hr but less than or equal to 0.40 g/bhp-hr.

~~ii~~b. Up to 50 annual hours of operation are allowed for maintenance and testing purposes if the diesel PM emission rate is greater than 0.01 g/bhp-hr but less than or equal to 0.15 g/bhp-hr.

~~iii~~c. Up to 100 annual hours of operation are allowed for maintenance and testing purposes if the diesel PM emission rate is less than or equal to 0.01 g/bhp-hr. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

~~b.~~(B) Additional Standards:
Owners or operators that choose to meet the diesel PM standards defined in ~~sub~~section ~~(e)(2)(B)3.a.~~93115.6(b)(3)(A) with emission control strategies that are not verified through the Verification Procedure shall either:

~~I~~1. Meet the applicable HC, NOx, NMHC+NOx, and CO standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression-~~i~~Ignition Engine Standards (title 13, CCR, section 2423). If no standards have been established for an off-road engine of the same model year and maximum rated power as the in-use stationary emergency standby diesel-fueled CI engine, then the in-use stationary emergency standby diesel-fueled CI engine shall meet the Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same

maximum rated power, irrespective of the in-use stationary emergency standby diesel-fueled CI engine's model year; Or

~~II~~2. Not increase CO emission rates by more than 10% above baseline; and
Not increase HC or NOx emission rates by more than 10% above baseline; or
Not increase the sum of NMHC and NOx emission rates above baseline.

~~c.~~(C) The District:

~~I~~1. may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate standards; and

~~II~~2. may establish more stringent limits on hours of maintenance and testing on a site-specific basis; and

~~III~~3. shall determine an appropriate limit on the number of hours of operation for demonstrating compliance with other District rules and initial start-up testing.

(c) *Operating Requirements and Emission Standards for New and In-Use Emergency Standby Stationary Diesel-Fueled CI Engines that Have a Rated Brake Horsepower of Greater than 50 (>50 bhp) Used in Demand Response Programs (DRP Engines)*

(1) *New Emergency Standby Diesel-Fueled CI DRP Engines (>50 bhp) Operating Requirements and Emission Standards*

(A) At-School and Near-School Provisions. No owner or operator shall operate a new stationary emergency standby diesel-fueled CI DRP engine for non-emergency use, including maintenance and testing, during the following periods:

1. whenever there is a school sponsored activity, if the engine is located on school grounds; and
2. between 7:30 a.m. and 3:30 p.m. on days when school is in session, if the engine is located within 500 feet of school grounds.

Section 93115.6(c)(1)(A) does not apply if the engine emits no more than 0.01 g/bhp-hr of diesel PM.

(B). No owner or operator shall operate any new stationary emergency standby diesel-fueled CI DRP engine (>50 bhp) in response to the notification of an impending rotating outage, unless the engine is operating pursuant to a DRP, or all of the following criteria are met:

1. the engine's permit to operate allows operation of the engine in anticipation of a rotating outage, or the District has established a policy or program that authorizes operation of the engine in anticipation of a rotating outage; and
2. the Utility Distribution Company has ordered rotating outages in the control area where the engine is located, or has indicated it expects to issue such an order at a specified time; and
3. the engine is in a specific location that is subject to the rotating outage in the control area; and

4. the engine is operated no more than 30 minutes prior to the time when the Utility Distribution Company officially forecasts a rotating outage in the control area; and
5. the engine operation is terminated immediately after the Utility Distribution Company advises that a rotating outage is no longer imminent or in effect.

(C) Except as provided in section 93115.3, no owner or operator shall operate any new stationary emergency standby diesel-fueled CI DRP engine (>50 bhp), unless it meets all of the following applicable operating requirements and emission standards:

1. Diesel PM Standard and Hours of Operating Requirements
   a. New DRP Engines enrolled in the RBRP on or after January 1, 2005, and prior to January 1, 2008, shall:
      I. meet the requirements specified in 93115.6(a)(3) and
      II. not operate more than 75 hours per year for RBRP operation.
   b. New DRP Engines enrolled in the RBRP on or after January 1, 2008, shall:
      I. meet the more stringent diesel PM standard of either 0.01 g/bhp-hr of diesel PM; or
      II. the current model year diesel PM standard as specified in the Off-Road Compression Ignition Engine Standards for off-road engines with the same maximum rated power (title 13, CCR, section 2423) in effect on the date of RBRP enrollment; and
      III. comply with the limitations on the hours of operation for maintenance and testing as specified in 93115.6(a)(3)(A)2.; and
      IV. not operate more than 75 hours per year for RBRP operation.
   c. New DRP Engines enrolled in an ISC on or after January 1, 2005, shall:
      I. meet the more stringent diesel PM standard of either 0.01 g/bhp-hr diesel PM; or
      II. the current model year diesel PM standard as specified in the Off-Road Compression Ignition Engine Standards for off-road engines with the same maximum rated power (title 13, CCR, section 2423) in effect on the date of ISC enrollment; and
      III. comply with the limitations on the hours of operation for maintenance and testing as specified in 93115.6(a)(3)(A)2.; and
      IV. not operate more than 150 hours per year for ISC operation.
2. HC, NOx, NMHC + NOx, and CO standards: No owner or operator shall operate any new stationary emergency standby diesel-fueled

CI DRP engine (>50 bhp), unless it meets the standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression Ignition Engine Standards (title 13, CCR, section 2423). If no standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary emergency standby diesel-fueled CI DRP engine, then the new stationary emergency standby diesel-fueled CI DRP engine shall meet the Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power, irrespective of the new stationary emergency standby diesel-fueled CI DRP engine's model year.

3. ~~The~~ A District:
   a. may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate standards; and
   b. may establish more stringent maintenance and testing hour of operation standards on a site-specific basis; and
   c. shall determine an appropriate limit on the number of hours of operation for demonstrating compliance with other District rules and initial start-up testing.

(D) For the purposes of complying with section 93115.6(c)(1), the less than or equal to 0.01 g/bhp-hr diesel PM emission standard, as applicable, may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 hp) that meets the 0.15 g/bhp-hr PM emission standard.

(2) *In-Use Emergency Standby Diesel-Fueled CI DRP Engine (> 50 bhp) Operating Requirements and Emission Standards*

(A) At-School and Near-School Provisions. No owner or operator shall operate an in-use stationary emergency standby diesel-fueled CI engine for non-emergency use, including maintenance and testing during the following periods:
   1. whenever there is a school sponsored activity, if the engine is located on school grounds; and
   2. between 7:30 a.m. and 3:30 p.m. on days when school is in session, if the engine is located within 500 feet of school grounds. Section 93115.6(c)(2)(A) does not apply if the engine emits no more than 0.01 g/bhp-hr of diesel PM.

(B) No owner or operator shall operate any in-use stationary emergency standby diesel-fueled CI DRP engine (>50 bhp) in response to the notification of an impending rotating outage, unless the engine is operating pursuant to a DRP, or all of the following criteria are met:
   a. the engine's permit to operate allows operation of the engine in anticipation of a rotating outage, or the District has established a policy or program that authorizes operation of the engine in anticipation of a rotating outage; and

b. the Utility Distribution Company has ordered rotating outages in the control area where the engine is located, or has indicated it expects to issue such an order at a certain time; and
c. the engine is in a specific location that is subject to the rotating outage in the control area; and
d. the engine is operated no more than 30 minutes prior to the time when the Utility Distribution Company officially forecasts a rotating outage in the control area; and
e. the engine operation is terminated immediately after the Utility Distribution Company advises that a rotating outage is no longer imminent or in effect.

(C) Except as provided in section 93115.3, no owner or operator shall operate any in-use stationary emergency standby diesel-fueled CI DRP engine (> 50 hp) unless it meets all of the following applicable operating requirements and emission standards:

1. Diesel PM Standard and Hours of Operation Requirements
   a. In-Use DRP Engines enrolled in the RBRP prior to January 1, 2005, shall:
      I. meet the diesel PM standards and hour of operation limitations specified in 93115.6(b)(3)(A) and (B); and
      II. not operate more than 75 hours per year for RBRP operation.
   b. In-Use DRP Engines enrolled in the RBRP on or after January 1, 2005, and prior to January 1, 2008, shall:
      I. meet a diesel PM standard of 0.15 g/bhp-hr diesel PM; and
      II. meet the requirements specified in 93115.6(b)(3)(A) for maintenance and testing hours of operation; and
      III. not operate more than 75 hours per year for RBRP operation.
   c. In-Use DRP Engines enrolled in the RBRP on or after January 1, 2008, shall:
      I. meet a diesel PM standard of 0.01 g/bhp-hr diesel PM; and
      II. meet the requirements specified in 93115.6(b)(3)(A) for maintenance and testing hours of operation; and
      III. not operate more than 75 hours per year for RBRP operation.
   d. In-Use DRP Engines enrolled in an ISC prior to January 1, 2005, shall as of January 1, 2006:
      I. meet a diesel PM standard of 0.15 g/bhp-hr diesel PM; and
      II. meet the requirements specified in 93115.6(b)(3)(A) for maintenance and testing hours of operation; and
      III. not operate more than 150 hours per year for ISC operation.
   e. In-Use DRP Engines enrolled in an ISC on or after January 1, 2005, and prior to January 1, 2008, shall:
      I. meet a diesel PM standard of 0.15 g/bhp-hr diesel PM; and

II. meet the requirements specified in 93115.6(b)(3)(A) for maintenance and testing hours of operation; and
III. not operate more than 150 hours per year for ISC operation.

f. In-Use DRP Engines enrolled in an ISC on or after January 1, 2008, shall:
I. meet a diesel PM standard of 0.01 g/bhp-hr diesel PM; and
II. meet the requirements specified in 93115.6(b)(3)(A) for maintenance and testing hours of operation; and
III. not operate more than 150 hours per year for ISC operation.

2. Additional Standards:
Owners or operators that choose to meet the diesel PM standards and hour of operation limits defined in section 93115.6(c)(2)(C) with emission control strategies that are not verified through the Verification Procedure shall either:
a. Meet the applicable HC, NOx, NMHC+NOx, and CO standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression Ignition Engine Standards (title 13, CCR, section 2423). If no standards have been established for an off-road engine of the same model year and maximum rated power as the in-use stationary emergency standby diesel-fueled CI DRP engine, then the in-use stationary emergency standby diesel-fueled CI DRP engine shall meet the Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power, irrespective of the in-use stationary emergency standby diesel-fueled CI DRP engine's model year; or
b. Not increase CO emission rates by more than 10% above baseline; and not increase HC or NOx emission rates by more than 10% above baseline, or not increase the sum of NMHC and NOx emission rates above baseline.

3. ~~The~~ A District:
a. may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate standards; and
b. may establish more stringent limits on hours of maintenance and testing on a site-specific basis; and
c. shall determine an appropriate limit on the number of hours of operation for demonstrating compliance with other District rules and initial start-up testing.

(D) For the purposes of complying with section 93115.6(c)(2), the less than or equal to 0.01 g/bhp-hr diesel PM emission standard, as applicable, may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

(3) *Other Requirements Specific to RBRP Engines and the San Diego Gas and Electric Company (SDGE)*

(A) The sum total electrical generation (also known as the "total load reduction capacity") from all diesel-fueled engines dispatched in the RBRP shall not exceed 80.0 megawatts (MW) at any time.

(B) RBRP Engines shall be dispatched by SDGE into service in accordance with a district-approved dispatch protocol as specified in section 93115.10(h)(2).

(4) *Requirements Applicable to DRP Engines after a DRP is Terminated* After a DRP is terminated by either the Utility Distribution Company or the engine owner or operator, the DRP engine shall remain subject to the requirements of subsection 93115.6(c) as if the DRP were still in effect.

~~(C) New Stationary Prime Diesel-Fueled CI Engine (> 50 bhp) Emission Standards~~

93115.7 Stationary Prime Diesel-Fueled CI Engine (>50 bhp) Emission Standards

(a) New Stationary Prime Diesel-Fueled CI Engine (>50 bhp) Emission Standards

As of January 1, 2005, except as provided in ~~sub~~section ~~(c)~~93115.3, no person shall sell, purchase, or lease for use in California a new stationary prime diesel-fueled CI engine that has a rated brake horsepower greater than 50 unless it meets the following applicable emission standards, and no owner or operator shall operate any new stationary prime diesel-fueled CI engine that has a rated brake horsepower greater than 50 unless it meets all of the following emission standards and operational requirements (which are summarized in Table 3):

TABLE 3: SUMMARY OF THE EMISSION STANDARDS FOR NEW STATIONARY PRIME DIESEL-FUELED CI ENGINES >50 BHP (SEE ~~SUB~~SECTION ~~(E)(2)(C)1.~~93115.7(a)(1))

DIESEL PM STANDARDS (g/bhp-hr)	HC, NOx NMHC+NOx, AND CO STANDARDS (g/bhp-hr)
Meet the more stringent of: ≤0.01[1,3] OR Off-Road CI Engine Certification Standard for an off-road engine of the same maximum rated power	Off-Road CI Engine Certification Standard for an off-road engine of the same model year and maximum rated power, or Tier 1 standard for an off-road engine of the same maximum rated power.[1,2]

1. May be subject to additional emission limitations as specified in current district rules, regulations, or policies governing distributed generation.
2. The option to comply with the Tier 1 standards is available only if no off-road engine certification standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary prime diesel-fueled CI engine.
3. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

~~1.~~(1) Diesel PM Standard: All new stationary prime diesel-fueled CI engines (> 50 bhp) shall ~~either~~ emit diesel PM at a rate that is less than or equal to 0.01 grams diesel PM per brake-horsepower-hour (g/bhp-hr) or ~~shall:~~

(A) shall meet the diesel PM standard, as specified in the Off-Road Compression Ignition Engine Standards for off-road engines with the same maximum rated power (title 13, CCR, section 2423), in effect on the date of acquisition or submittal, as defined in ~~sub~~section ~~(d)~~93115.4, whichever is more stringent, or

(B) may satisfy the less than or equal to 0.01 g/bhp-hr diesel PM emission standard by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 enginefor engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

~~2.~~(2) HC, NOx, NMHC+NOx, and CO Standards: All new stationary prime diesel-fueled CI engines (> 50 bhp) shall meet the standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression-Ignition Engine Standards (title 13, CCR, section 2423). If no limits have been established for an off-road engine of the same model year and maximum rated power as the new stationary prime diesel-fueled CI engine, then the new stationary prime diesel-fueled CI engine shall meet the Tier 1 standards in title 13, CCR, section 2423, for an off-road engine of the same maximum rated power, irrespective of the new stationary prime diesel-fueled CI engine's model year;

~~3.~~(3) New stationary prime diesel-fueled CI engines that are used to provide electricity near the place of use (also known as "distributed generation") may be subject to additional emission limitations as specified in current district rules, policies, or regulations governing distributed generation;

~~4.~~(4) The District may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate limits on a site-specific basis.

~~(D) In-Use Stationary Prime Diesel-Fueled CI Engine (> 50 bhp) Emission Standards~~

(b) In-Use Stationary Prime Diesel-Fueled CI Engine (>50 bhp) Emission Standards

Except as provided in ~~sub~~section ~~(c)~~93115.3, no owner or operator shall operate an in-use stationary prime diesel-fueled CI engines (> 50 bhp) in California unless it meets the following requirements (which are summarized in Table 4):

TABLE 4: SUMMARY OF THE EMISSION STANDARDS FOR IN-USE STATIONARY PRIME DIESEL-FUELED CI ENGINES > 50 BHP (SEE ~~SUB~~SECTION ~~(e)(2)(D)1.~~ 93115.7(b)(1))		
DIESEL PM		OTHER POLLUTANTS
DIESEL PM STANDARDS (g/bhp-hr)		HC, NOx, NMHC+NOx, AND CO STANDARDS (g/bhp-hr)
Applicability	**Standard**	
All off-road certified in-use prime engines	85% reduction from baseline levels (Option 1) OR 0.01 g/bhp-hr[2] (Option 2)	For engines with emission control strategies not verified through the verification procedure: Off-Road CI Engine Certification Standards for an off-road engine of the same model year and maximum rated power, or Tier 1 standards for an off-road engine of the same maximum rated power.[1] OR Both (i) and (ii) must be met: (i) No increase in HC or NOx emissions above 10% from baseline levels OR No increase in NMHC+NOx emissions above baseline levels (ii) No increase in CO above 10% from baseline levels
Only in-use prime engines NOT certified in accordance with the Off-Road Compression Ignition Standards	85% reduction from baseline levels (Option 1) OR 0.01 g/bhp-hr[2] (Option 2) OR [30% reduction from baseline levels AND 0.01 g/bhp-hr[2] by no later than July 1, 2011] (Option 3)	

1. The option to comply with the Tier 1 standards is available only if no off-road engine certification standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary emergency standby diesel-fueled CI engine.
2. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

~~1.~~(1) Diesel PM Standards: All in-use stationary prime diesel-fueled CI engines (> 50 bhp) certified in accordance with the Off-Road Compression-_Ignition Engine Standards (title 13, CCR, section 2423) shall comply with either option 1 or option 2 below. All engines not certified in accordance with the Off-Road Compression-_Ignition Engine Standards (title 13, CCR, section 2423) shall comply with option 1, option 2, or option 3 below:

~~a.~~(A) Option 1: Reduce the diesel PM emission rate by at least 85 percent, by weight, from the baseline level, in accordance with the appropriate compliance schedule specified in ~~sub~~sections ~~(f)~~93115.11 and ~~(g)~~93115.12;

~~b.~~(B) Option 2: Emit diesel PM at a rate less than or equal to 0.01 g/bhp-hr in accordance with the appropriate compliance schedule as specified in ~~sub~~sections ~~(f)~~93115.11 and ~~(g)~~93115.12;

~~c.~~(C) Option 3: Reduce the diesel PM emission rate by at least 30% from the baseline level, by no later than January 1, 2006, and emit diesel PM at a rate of 0.01 g/bhp-hr or less by no later than July 1, 2011.

(D) For the purposes of complying with subsection (B) (Option 2) or subsection (C) (Option 3), above, the less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

~~2.~~(2) Additional Standards:

Owners or operators that choose to meet the diesel PM limits defined in ~~sub~~section ~~(e)(2)(D)1.a.~~93115.7(b) with emission control strategies that are not verified through the Verification Procedure shall either:

~~a.~~(A) Meet the applicable HC, NOx, NMHC+NOx, and CO standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression-Ignition Engine Standards (title 13, CCR, section 2423). If no standards have been established for an off-road engine of the same model year and maximum rated power as the in-use stationary prime diesel-fueled CI engine, then the in-use stationary prime diesel-fueled CI engine shall meet the Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power, irrespective of the new stationary emergency standby diesel-fueled CI engine's model year; or

~~b.~~ (B) Not increase CO emission rates by more than 10% above baseline; and

Not increase HC or NOx emission rates by more than 10% above baseline, or

Not increase the sum of NMHC and NOx emission rates above baseline.

~~3.~~(3) The District may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate standards.

~~(E) Emission Standards for New Stationary Diesel-Fueled CI Engines (> 50 bhp) Used in Agricultural Operations~~

93115.8 Emission Standards for Stationary Diesel-Fueled CI Engines (>50 bhp) Used in Agricultural Operations

(a) Emission Standards for New Stationary Diesel-Fueled CI Engines (>50 bhp) Used in Agricultural Operations

~~1.~~(1) As of January 1, 2005, except as provided in ~~sub~~sections ~~(c)~~ 93115.3, 93115.8(a)(1)(A)5., and ~~subsection (e)(2)(E)2.~~93115.8(a)(2), no person shall sell, purchase, or lease for use in California any new stationary diesel-fueled engine to be used in agricultural operations that has a rated brake horsepower greater

than 50, or operate any new stationary diesel-fueled engine to be used in agricultural operations that has a rated brake horsepower greater than 50, unless the engine meets all of the following emission performance standards (which are summarized in Table 5.):

TABLE 5: SUMMARY OF THE EMISSION STANDARDS FOR NEW STATIONARY DIESEL-FUELED CI ENGINES > 50 BHP USED IN AGRICULTURAL OPERATIONS (SEE ~~SUBSECTION (e)(2)(E)~~93115.8(a))

Horsepower Range (hp)	DIESEL PM	OTHER POLLUTANTS
	DIESEL PM STANDARDS (g/bhp-hr)	HC, NOx, NMHC+NOx, AND CO STANDARDS (g/bhp-hr)
All Applications ~~Other Than Generator Set Operations~~Greater Than ~~>~~50 But Less Than ~~to <~~ 99 100, Other Than Generator Sets	Less Than or Equal to ~~<~~0.30[1] OR Off-Road CI Engine Certification Standard for an off-road engine of the same maximum rated power, whichever is more stringent[2]	Off-Road CI Engine Certification Standard for an off-road engine of the same model year and maximum rated power, or Tier 1 standard for an off-road engine of the same maximum rated power.[1]
All Applications ~~Other Than Generator Set Operations~~Greater Than or Equal to ~~>~~99100 But Less Than ~~to <~~ 175, Other Than Generator Sets	Less Than or Equal to ~~<~~0.22[1] OR Off-Road CI Engine Certification Standard for an off-road engine of the same maximum rated power, whichever is more stringent[2]	
All Applications Greater Than or Equal to 175, Other Than Generator Sets	Less than or Equal to 0.15[1] OR Off-Road Engine Certification Standard for an off-road engine of the same maximum rated power, whichever is more stringent[2]	
Generator Set Engines Greater Than ~~>~~50	Less Than or Equal to ~~<~~0. 15[1] OR Off-Road CI Engine Certification Standard for an off-road engine of the same maximum rated power, whichever is more stringent.[2]	

1. Prior to January 1, 2008, these limits shall not apply to engines sold from one agricultural operation to another and funded under State or federal incentive funding programs, as specified in ~~(e)(2)(E)2~~93115.8(a)(2).
2. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

~~a.~~(A) Diesel PM Standard:

~~1~~1. New agricultural stationary diesel-fueled CI engines, used in all agricultural operations except generator set applications with a

maximum rated horsepower greater than 50 but less than ~~or equal to 99~~100 shall emit no more than 0.30 g/bhp-hr diesel particulate matter (PM) limit or shall meet the standards, as specified in the Off-Road Compression-_Ignition Engine Standards for off-road engines of the same maximum rated power (title 13, CCR, section 2423), in effect on the date of acquisition or submittal, as defined in ~~sub~~section ~~(d)~~93115.4, whichever is more stringent; and

~~II~~2. New agricultural stationary diesel-fueled CI engines, used in all agricultural operations except generator set applications with a maximum rated horsepower greater than or equal to 100~~99~~ but less than 175 shall emit no more than 0.22 g/bhp-hr diesel particulate matter (PM) limit or shall meet the standards, as specified in the Off-Road Compression-_Ignition Engine Standards for off-road engines of the same maximum rated power (title 13, CCR, section 2423), in effect on the date of acquisition or submittal, as defined in ~~sub~~section ~~(d)~~93115.4 whichever is more stringent; and

3. New agricultural stationary diesel-fueled CI engines, used in all agricultural operations except generator set applications with a maximum rated horsepower greater than or equal to 175 shall emit no more than 0.15 g/bhp-hr diesel PM or shall meet the standards, as specified in the Off-Road Compression Ignition Engine Standards for off-road engines of the same maximum rated power (title 13, CCR, section 2423), in effect on the date of acquisition or submittal, as defined in section 93115.4, whichever is more stringent; and

~~III~~4. New agricultural stationary diesel-fueled CI engines, used in generator set applications with a maximum rated horsepower greater than 50, shall emit no more than 0.15 g/bhp-hr diesel PM, or shall meet the standards, as specified in the Off-Road Compression-_Ignition Engine Standards for off-road engines of the same maximum rated power (title 13, CCR, section 2423), in effect on the date of acquisition or submittal, as defined in ~~sub~~section ~~(d)~~ 93115.4, whichever is more stringent;

5. On a site-specific basis, a District may extend compliance with sections 93115.8(a)(1)(A)1. through 4. up to four years provided:
   a. The District determines that an engine meeting sections 93115.8(A)1. through 4. would exceed the District's threshold for significant risk pursuant to H&SC section 44391 (AB 2588 "Hot Spots" Program), and
   b. No later than four years after the applicable initial compliance date for sections 93115.8(a)(1)(A)1. through 4., one of the following is installed:
      I. an electric motor;
      II. an engine greater than 50 bhp but less than 75 bhp that does not exceed 0.02 g/bhp-hr PM; or

III. an engine greater than 75 bhp that does not exceed 0.01 g/bhp-hr diesel PM.

6. For the purposes of complying with subsections(A)(1) through (5) above, a less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

~~b.~~(B) NMHC, NOx, and CO Standards: New agricultural stationary diesel-fueled CI engines shall meet the HC, NOx, (or NMHC+NOx, if applicable) and CO standards for off-road engines of the same model year and maximum rated power, as specified in the Off-Road Compression-Ignition Engine Standards (title 13, CCR, section 2423). If no limits have been established for an off-road engine of the same model year and maximum rated power as the new agricultural stationary diesel-fueled CI engine, then the new agricultural stationary diesel-fueled CI engine shall meet the Tier 1 standards in title 13, CCR, section 2423, for an off-road engine of the same maximum rated power, irrespective of the new agricultural diesel-fueled CI engine's model year.

~~2.~~(2) Prior to January 1, 2008, the requirements of ~~sub~~sections ~~(e)(2)(E)1.~~ 93115.8(a)(1) shall not apply to any stationary diesel-fueled CI engine that:

~~a.~~(A) is used in agricultural operations; and

~~b.~~(B) was funded under a State or federal incentive funding program; and

~~c.~~(C) was sold for use in another agricultural operation, provided the stationary diesel-fueled CI engine complies with Tier II Off-Road Compression Ignition Standards for off-road engines of the same maximum rated power (title 13, CCR, section 2423).

For purposes of this subsection, State or federal incentive funding programs include, but are not limited to, California's Carl Moyer Program, as set forth in title 17, Part 5, Chapter 9 of the California Health and Safety Code, and the U.S. Department of Agriculture's Environmental Quality Incentives Program (EQIP), as set forth in title 7, Chapter XIV, Part 1466 of the Code of Federal Regulations.

(b) Emission Standards for In-Use Stationary Diesel-Fueled CI Engines (>50 bhp) Used in Agricultural Operations

(1) Except as provided in sections 93115.3 and 93115.8(b)(5) through (7), no owner or operator shall operate an in-use stationary diesel-fueled CI engine greater than 50 bhp in an agricultural operation in California unless it meets the requirements in sections 93115.8(b)(2) through (4) (which are summarized in Tables 6 and 7):

TABLE 6: EMISSION STANDARDS
NONCERTIFIED GREATER THAN 50 BHP IN-USE STATIONARY
DIESEL-FUELED ENGINES USED IN AGRICULTURAL OPERATIONS
SEE SECTIONS 93115.8(b)(2) AND (4)

Horsepower Range	Application	Compliance On or After December 31	Diesel PM Not to Exceed (g/bhp-hr)	HC, NOx, NMHC+NOx, and CO Not to Exceed (g/bhp-hr)
Greater Than 50 But Less Than 75	Generator Sets	2015	0.02	Off-Road CI Engine Certification Standards for an off-road engine of the same model year and maximum rated power.[1]
	All Other Applications	2011	0.30	
Greater Than or Equal to 75 But Less Than 100	Generator Sets	2015	0.01[2]	
	All Other Applications	2011	0.30	
Greater Than or Equal to 100 But Less Than 175	Generator Sets	2015	0.01[2]	
	All Other Applications	2010	0.22	
Greater Than or Equal to 175 But Less Than or Equal to 750	All Applications	2010	0.15	
Greater Than 750	All Applications	2014	0.075	

1. If no limits have been established for an off-road engine of the same model year and maximum rated power, then the in-use stationary diesel-fueled engine used in an agricultural operation shall not exceed Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power irrespective of model year.
2. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

TABLE 7: EMISSION STANDARDS TIER 1- AND TIER 2-CERTIFIED GREATER THAN 50 BHP IN-USE STATIONARY DIESEL-FUELED ENGINES USED IN AGRICULTURAL OPERATIONS SEE SECTIONS 93115.8(b)(3) AND (4)			
Horsepower Range	**Compliance On or After December 31**	**Diesel PM Not to Exceed (g/bhp-hr)**	**HC, NOx, NMHC+NOx, and CO Not to Exceed (g/bhp-hr)**
Greater Than 50 But Less Than 75	2015 or 12 years after the date of initial installation, whichever is later	0.02	Off-Road CI Engine Certification Standards for an off-road engine of the same model year and maximum rated power.[1]
Greater Than or Equal to 75 But Less Than 175	2015 or 12 years after the date of initial installation, whichever is later	0.01[2]	
Greater Than or Equal to 175 But Less Than or Equal to 750	2014 or 12 years after the date of initial installation, whichever is later	0.01[2]	
Greater Than 750	2014 or 12 years after the date of initial installation, whichever is later	0.075	

1. If no limits have been established for an off-road engine of the same model year and maximum rated power, then the in-use stationary diesel-fueled engine used in an agricultural operation shall not exceed Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power irrespective of model year.
2. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

(2) Diesel PM Standards for Noncertified In-use Stationary Diesel-fueled CI Engines Used in Agricultural Operations (except as provided in section 93115.3):

(A) On or after December 31, 2015, no owner or operator shall operate any greater than 50 but less than 75 bhp noncertified stationary diesel-fueled generator set engine used in an agricultural operation unless such generator set engine's diesel PM emissions do not exceed 0.02 g/bhp-hr.

(B) On or after December 31, 2015, no owner or operator shall operate any greater than or equal to 75 but less than 175 bhp noncertified stationary diesel-fueled generator set engine used in an agricultural operation unless such generator set engine's diesel PM emissions do not exceed 0.01 g/bhp-hr. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

(C) On or after December 31, 2011, no owner or operator shall operate any greater than 50 but less than 75 bhp noncertified stationary diesel-fueled engine (other than a generator set engine) used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.30 g/bhp-hr.

(D) On or after December 31, 2011, no owner or operator shall operate any greater than or equal to 75 but less than 100 bhp noncertified stationary diesel-fueled engine (other than a generator set engine) used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.30 g/bhp-hr.

(E) On or after December 31, 2010, no owner or operator shall operate any greater than or equal to 100 but less than 175 bhp noncertified stationary diesel-fueled engine (other than a generator set engine) used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.22 g/bhp-hr.

(F) On or after December 31, 2010, no owner or operator shall operate any greater than or equal to 175 through 750 bhp noncertified stationary diesel-fueled engine used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.15 g/bhp-hr.

(G) On or after December 31, 2014, no owner or operator shall operate any greater than 750 bhp noncertified stationary diesel-fueled engine used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.075 g/bhp-hr.

(3) Diesel PM Standards for Tier 1- and Tier 2-Certified In-use Stationary Diesel-fueled Engines Used in Agricultural Operations (except as provided in section 93115.3):

(A) On or after December 31, 2015, or 12 years after the date of initial installation, whichever is later, no owner or operator shall operate any greater than 50 but less than 75 bhp Tier 1- or Tier 2-certified stationary diesel-fueled engine used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.02 g/bhp-hr.

(B) On or after December 31, 2015, or 12 years after the date of initial installation, whichever is later, no owner or operator shall operate any greater than or equal to 75 but less than 175 bhp Tier 1- or Tier 2-certified stationary diesel-fueled engine used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.01 g/bhp-hr. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

(C) On or after December 31, 2014, or 12 years after the date of initial installation, whichever is later, no owner or operator shall operate any greater than or equal to 175 through 750 bhp Tier 1- or Tier 2-certified stationary diesel-fueled engine used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.01 g/bhp-hr. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

(D) On or after December 31, 2014 or 12 years after the date of initial installation, whichever is later, no owner or operator shall operate any greater than 750 bhp Tier 1- or Tier 2-certified stationary diesel-fueled engine used in an agricultural operation unless such engine's diesel PM emissions do not exceed 0.075 g/bhp-hr.

(4) HC, NOx, NMHC+NOx, and CO Standards: An agricultural operation shall not exceed the HC, NOx (or NMHC+NOx, if applicable) and CO standards for off-road engines of the same model year and maximum rated power, as specified in the Off-Road CI Engine Standards (title 13, CCR, section 2423). If no limits have been established for an off-road engine of the same model year and maximum rated power, then the in-use stationary diesel-fueled engine used in an agricultural operation shall not exceed Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power irrespective of model year.

(5) The Executive Officer may extend the compliance dates in sections 93115.8(b)(1) through (4) up to one year, provided that verifiable information shows new engine packages for stationary diesel engine applications are not available in sufficient numbers or in a sufficient range of makes, models, and sizes to replace in-use stationary diesel agricultural engines.

(6) On a site-specific basis, a District may extend compliance dates in sections 93115.8(b)(1), (2), and (4) up to four years provided:

a. A District determines that an engine meeting section 93115.8(b)(2) would exceed a District's threshold for significant risk pursuant to H&SC section 44391 (AB 2588 "Hot Spots" Program), and

b. No later than four years after the applicable initial compliance date for section 93115.8(b)(2), one of the following is installed:

I. an electric motor;

II. an engine greater than 50 bhp but less than 75 bhp that does not exceed 0.02 g/bhp-hr PM; or

III. an engine greater than 75 bhp that does not exceed 0.01 g/bhp-hr diesel PM. The less than or equal to 0.01 g/bhp-hr diesel PM emission standard may be satisfied by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.

(7) A District may:

(A) Allow an owner or operator up to two additional years to comply with sections 93115.8(b)(1) through (4), provided at least 60 days prior to the applicable compliance date or dates, the owner or operator submits to the District Air Pollution Control Officer documentation demonstrating that an affected engine or engines shall be replaced with an electric motor or electric motors within two years. Documentation for each engine replaced shall include identification of the engine, the purchasing agreement for the electric motor, and a copy of an agreement with a utility

distribution company to provide electricity if electricity is not already available for electric motor operation.

(B) Establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission limits, emission limit compliance dates, or other requirements.

(c) Registration Requirements for Greater than 50 bhp Stationary Diesel-Fueled CI Agricultural Engines

(1) Registration Submittal - Except as provided in section 93115.2(a), the owner or operator of a greater than 50 bhp stationary diesel-fueled CI agricultural engine or engines shall submit the registration information specified in section (c)(2) below to the District according to the following schedule:

(A) For each in-use stationary diesel-fueled CI agricultural engine, no later than March 1, 2008; and

(B) For each new stationary diesel-fueled CI agricultural engine, no later than 90 days after the date of initial installation.

(2) Registration Information

(A) At minimum, the owner or operator shall submit the following information for each greater than 50 bhp stationary diesel-fueled CI agricultural engine:

1. Date of registration application submittal;
2. Name, title (as applicable), and signature of person submitting the registration application;
3. Name, address, mailing address (if differs from address), and telephone number of the engine owner and of the operator, if the owner is not also the operator;
4. Date of installation or anticipated installation;
5. Year of manufacture or approximate age, if unable to determine year of manufacture;
6. Make;
7. Model;
8. Serial number;
9. Maximum rated brake horsepower;
10. Certification status with respect to Off-Road CI Engine Certification Standards (title 13, CCR, section 2413) (if available)
11. Estimated annual average operating hours;
12. Fuels Used;
13. Estimated annual average gallons of each fuel used, if alternative diesel fuels are used;
14. Location including, but not limited to, one of the following: latitude and longitude, universal trans meridian (UTM) coordinates, global positioning satellite data (GPS), address, town and nearest cross streets, parcel or plot number/designation, or other description that clearly identifies the location of the engine; and
15. For an engine located within one-quarter mile of (1,320 feet) of a residential area, school, or hospital:
    a. Distance (in meters or feet) from engine to residential area, school, or hospital;

b. Direction from engine to residential area, school, or hospital;

c. Location of engine and residential area, school, or hospital including one or more of the following for each: latitude and longitude, universal trans meridian (UTM) coordinates, global positioning satellite data (GPS), address, town and nearest cross streets.

(B) Any additional information required to evaluate the section 93115.3(a) exemption of an agricultural emergency standby generator set engine or a remotely-located agricultural engine from the requirements of section 93115.8(b).

(3) The owner or operator of an in-use stationary diesel-fueled CI agricultural engine registered under section 93115.8(c)(1)(A) shall notify the District in writing no later than 14 days after any change of owner or operator, change in location, installation or commencement of an emissions control strategy, or replacement with an electric motor or noncompression ignition engine.

(4) A District may provide stationary diesel-fueled CI agricultural engine owners and operators with alternatives to section 93115.8(c)(1) through (3) requirements, provided the Executive Officer finds such alternatives to be equivalent to sections 93115.8(c)(1) through (3).

(5) Upon written request by the Executive Officer, an APCO shall provide to the Executive Officer a written report of information gathered under sections 93115.8(c)(1) through (4).

(d) Fee Requirements for Greater than 50 bhp Stationary Diesel-Fueled CI Agricultural Engine Owners or Operators

The owner or operator of a greater than 50 bhp stationary diesel-fueled CI agricultural engine or engines shall pay any fees assessed by the District for the purpose of recovering the District's cost of implementing and enforcing section 93115.8 requirements, including section 93115.8(c) requirements.

~~(F) Operating Requirements and Emission Standards for New and In-Use Emergency Standby Stationary Diesel-Fueled CI Engines that Have a Rated Brake Horsepower of Greater than 50 (>50 bhp) Used in Demand Response Programs (DRP Engines)~~

~~1. New Emergency Standby Diesel-Fueled CI DRP Engines (>50 bhp) Operating Requirements and Emission Standards~~

~~a. At-School and Near-School Provisions. No owner or operator shall operate a new stationary emergency standby diesel-fueled CI DRP engine for non-emergency use, including maintenance and testing, during the following periods:~~

~~I. whenever there is a school sponsored activity, if the engine is located on school grounds; and~~

~~II. between 7:30 a.m. and 3:30 p.m. on days when school is in session, if the engine is located within 500 feet of school grounds. Subsection (e)(2)(F)1.a. does not apply if the engine emits no more than 0.01 g/bhp-hr of diesel PM.~~

b. No owner or operator shall operate any new stationary emergency standby diesel-fueled CI DRP engine (>50 bhp) in response to the notification of an impending rotating outage, unless the engine is operating pursuant to a DRP, or all of the following criteria are met:
   I. the engine's permit to operate allows operation of the engine in anticipation of a rotating outage, or the District has established a policy or program that authorizes operation of the engine in anticipation of a rotating outage; and
   II. the Utility Distribution Company has ordered rotating outages in the control area where the engine is located, or has indicated it expects to issue such an order at a specified time; and
   III. the engine is in a specific location that is subject to the rotating outage in the control area; and
   IV. the engine is operated no more than 30 minutes prior to the time when the Utility Distribution Company officially forecasts a rotating outage in the control area; and
   V. the engine operation is terminated immediately after the Utility Distribution Company advises that a rotating outage is no longer imminent or in effect.

c. Except as provided in subsection (c), no owner or operator shall operate any new stationary emergency standby diesel-fueled CI DRP engine (>50 bhp), unless it meets all of the following applicable operating requirements and emission standards:
   I. Diesel PM Standard and Hours of Operating Requirements
      i. New DRP Engines enrolled in the RBRP on or after January 1, 2005, and prior to January 1, 2008, shall:
         aa. meet the requirements specified in (e)(2)(A)3. and
         bb. not operate more than 75 hours per year for RBRP operation.
      ii. New DRP Engines enrolled in the RBRP on or after January 1, 2008, shall:
         aa. meet the more stringent diesel PM standard of either 0.01 g/bhp-hr of diesel PM; or
         bb. the current model year diesel PM standard as specified in the Off-Road Compression Ignition Engine Standards for off-road engines with the same maximum rated power (title 13, CCR, section 2423) in effect on the date of RBRP enrollment; and
         cc. comply with the limitations on the hours of operation for maintenance and testing as specified in (e)(2)(A)3.a.II.; and
         dd. not operate more than 75 hours per year for RBRP operation.
      iii. New DRP Engines enrolled in an ISC on or after January 1, 2005, shall:
         aa. meet the more stringent diesel PM standard of either 0.01 g/bhp-hr diesel PM; or

bb. the current model year diesel PM standard as specified in the Off-Road Compression Ignition Engine Standards for off-road engines with the same maximum rated power (title 13, CCR, section 2423) in effect on the date of ISC enrollment; and

cc. comply with the limitations on the hours of operation for maintenance and testing as specified in (e)(2)(A)3.a.II.; and

dd. not operate more than 150 hours per year for ISC operation.

II. HC, NOx, NMHC + NOx, and CO standards: No owner or operator shall operate any new stationary emergency standby diesel fueled CI DRP engine (>50 bhp), unless it meets the standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression-_ignitionEngine Standards (title 13, CCR, section 2423). If no standards have been established for an off-road engine of the same model year and maximum rated power as the new stationary emergency standby diesel fueled CI DRP engine, then the new stationary emergency standby diesel fueled CI DRP engine shall meet the Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power, irrespective of the new stationary emergency standby diesel fueled CI DRP engine's model year.

III. The District:

i. may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate standards; and

ii. may establish more stringent maintenance and testing hour of operation standards on a site-specific basis; and

iii. shall determine an appropriate limit on the number of hours of operation for demonstrating compliance with other District rules and initial start-up testing.

2. In-Use Emergency Standby Diesel-Fueled CI DRP Engine (> 50 bhp) Operating Requirements and Emission Standards

a. At-School and Near-School Provisions. No owner or operator shall operate an in-use stationary emergency standby diesel-fueled CI engine for non-emergency use, including maintenance and testing during the following periods:

I. whenever there is a school sponsored activity, if the engine is located on school grounds; and

II. between 7:30 a.m. and 3:30 p.m. on days when school is in session, if the engine is located within 500 feet of school grounds. Subsection (e)(2)(F)2.a. does not apply if the engine emits no more than 0.01 g/bhp-hr of diesel PM.

b. No owner or operator shall operate any in-use stationary emergency standby diesel-fueled CI DRP engine (>50 bhp) in response to the

notification of an impending rotating outage, unless the engine is operating pursuant to a DRP, or all of the following criteria are met:

I. the engine's permit to operate allows operation of the engine in anticipation of a rotating outage, or the District has established a policy or program that authorizes operation of the engine in anticipation of a rotating outage; and

II. the Utility Distribution Company has ordered rotating outages in the control area where the engine is located, or has indicated it expects to issue such an order at a certain time; and

III. the engine is in a specific location that is subject to the rotating outage in the control area; and

IV. the engine is operated no more than 30 minutes prior to the time when the Utility Distribution Company officially forecasts a rotating outage in the control area; and

V. the engine operation is terminated immediately after the Utility Distribution Company advises that a rotating outage is no longer imminent or in effect.

c. Except as provided in subsection (c), no owner or operator shall operate any in-use stationary emergency standby diesel-fueled CI DRP engine (> 50 hp) unless it meets all of the following applicable operating requirements and emission standards:

I. Diesel PM Standard and Hours of Operation Requirements

i. In-Use DRP Engines enrolled in the RBRP prior to January 1, 2005, shall:

aa. meet the diesel PM standards and hour of operation limitations specified in (e)(2)(B)3.a. and (e)(2)(B)3.b.; and

bb. not operate more than 75 hours per year for RBRP operation.

ii. In-Use DRP Engines enrolled in the RBRP on or after January 1, 2005, and prior to January 1, 2008, shall:

aa. meet a diesel PM standard of 0.15 g/bhp-hr diesel PM; and

bb. meet the requirements specified in (e)(2)(B)3.a. for maintenance and testing hours of operation; and

cc. not operate more than 75 hours per year for RBRP operation.

iii. In-Use DRP Engines enrolled in the RBRP on or after January 1, 2008, shall:

aa. meet a diesel PM standard of 0.01 g/bhp-hr diesel PM; and

bb. meet the requirements specified in (e)(2)(B)3.a. for maintenance and testing hours of operation; and

cc. not operate more than 75 hours per year for RBRP operation.

iv. In-Use DRP Engines enrolled in an ISC prior to January 1, 2005, shall as of January 1, 2006:

aa. meet a diesel PM standard of 0.15 g/bhp-hr diesel PM; and

bb. meet the requirements specified in (e)(2)(B)3.a. for maintenance and testing hours of operation; and
cc. not operate more than 150 hours per year for ISC operation.

v. In-Use DRP Engines enrolled in an ISC on or after January 1, 2005, and prior to January 1, 2008, shall:
aa. meet a diesel PM standard of 0.15 g/bhp-hr diesel PM; and
bb. meet the requirements specified in (e)(2)(B)3.a. for maintenance and testing hours of operation; and
cc. not operate more than 150 hours per year for ISC operation.

vi. In-Use DRP Engines enrolled in an ISC on or after January 1, 2008, shall:
aa. meet a diesel PM standard of 0.01 g/bhp-hr diesel PM; and
bb. meet the requirements specified in (e)(2)(B)3.a. for maintenance and testing hours of operation; and
cc. not operate more than 150 hours per year for ISC operation.

II. Additional Standards:
Owners or operators that choose to meet the diesel PM standards and hour of operation limits defined in subsection (e)(2)(F)2.c. with emission control strategies that are not verified through the Verification Procedure shall either:

i. Meet the applicable HC, NOx, NMHC+NOx, and CO standards for off-road engines of the same model year and maximum rated power as specified in the Off-Road Compression-ignition Engine Standards (title 13, CCR, section 2423). If no standards have been established for an off-road engine of the same model year and maximum rated power as the in-use stationary emergency standby diesel-fueled CI DRP engine, then the in-use stationary emergency standby diesel-fueled CI DRP engine shall meet the Tier 1 standards in title 13, CCR, section 2423 for an off-road engine of the same maximum rated power, irrespective of the in-use stationary emergency standby diesel-fueled CI DRP engine's model year; or

ii. Not increase CO emission rates by more than 10% above baseline; and not increase HC or NOx emission rates by more than 10% above baseline, or not increase the sum of NMHC and NOx emission rates above baseline.

III. The District:

i. may establish more stringent diesel PM, NMHC+NOx, HC, NOx, and CO emission rate standards; and

ii. may establish more stringent limits on hours of maintenance and testing on a site-specific basis; and

~~iii. shall determine an appropriate limit on the number of hours of operation for demonstrating compliance with other District rules and initial start-up testing.~~

~~3. Other Requirements Specific to RBRP Engines and the San Diego Gas and Electric Company (SDGE)~~

~~a. The sum total electrical generation (also known as the "total load reduction capacity") from all diesel-fueled engines dispatched in the RBRP shall not exceed 80.0 megawatts (MW) at any time.~~

~~b. RBRP Engines shall be dispatched by SDGE into service in accordance with a district-approved dispatch protocol as specified in subsection (e)(4)(J)2.~~

~~4. Requirements Applicable to DRP Engines after a DRP is Terminated After a DRP is terminated by either the Utility Distribution Company or the engine owner or operator, the DRP engine shall remain subject to the requirements of subsection (e)(2)(F) as if the DRP were still in effect.~~

~~(3) Emission Standards for New Stationary Diesel-Fueled CI Engines, Less Than or Equal to 50 Brake Horsepower (< 50 bhp).~~

93115.9 Emission Standards for New Stationary Diesel-Fueled Engines, Less Than or Equal to 50 Brake Horsepower (<50 bhp)

As of January 1, 2005, except as provided in ~~sub~~section ~~(c)~~93115.3, no person shall sell, offer for sale, or lease for use in California any stationary diesel-fueled CI engine that has a rated brake horsepower less than or equal to 50, unless the engine meets the current Off-Road Compression-~~i~~Ignition Engine Standards (title 13, CCR, section 2423) for PM, NMHC+NOx, and CO for diesel off-road engines of the same maximum rated power. (These requirements are summarized in Table ~~6~~8.)

TABLE ~~6~~8: SUMMARY OF THE EMISSION STANDARDS FOR STATIONARY DIESEL-FUELED CI ENGINES ≤ 50 BHP (SEE ~~SUBSECTION (e)(3)~~93115.9)
DIESEL PM STANDARDS, NMHC+NOx, AND CO STANDARDS (g/bhp-hr)
Current Off-Road CI Engine Certification Standard for an off-road engine of the same maximum rated power

~~(4) Recordkeeping, Reporting, and Monitoring Requirements~~

93115.10 Recordkeeping, Reporting, and Monitoring Requirements

(~~A~~a) Reporting Requirements for Owners or Operators of New and In-Use Stationary CI Engines, Including Non-Diesel-Fueled CI Engines, Having a Rated Horsepower Greater than 50 (> 50 bhp)

~~1.~~(1) Except as provided in ~~sub~~section ~~(c)~~93115.3 and ~~sub~~section ~~(e)(4)(A)5.~~93115.10(a)(5) below, prior to the installation of any new stationary CI engine (> 50 bhp) at a facility, each owner or operator shall provide the information identified in ~~sub~~section ~~(e)(4)(A)3.~~ 93115.10(a)(3) to the District APCO.

~~2.~~(2) Except as provided in ~~sub~~section ~~(c)~~93115.3 and ~~sub~~section ~~(e)(4)(A)5.~~ 93115.10(a)(5) below, ~~and~~ no later than July 1, 2005, each owner or operator of an in-use stationary CI engine (>50 bhp) shall provide the information specified in ~~sub~~section ~~(e)(4)(A)3.~~93115.10(a)(3) to the District APCO.

~~3.~~(3) Each owner or operator shall submit to the District APCO the following information for each new and in-use stationary CI engine (>50 bhp) in accordance with the requirements of ~~sub~~sections ~~(e)(4)(A)1. and (e)(4)(A)2.~~ 93115.10(a)(1) and (2) above:

~~a.~~(A) Owner/Operator Contact Information

~~I~~1. Company name

~~II~~2. Contact name, phone number, address, e-mail address

~~III~~3. Address of engine(s)

~~b.~~(B) Engine Information

~~I~~1. Make,

~~II~~2. Model,

~~III~~3. Engine Family,

~~IV~~4. Serial number,

~~V~~5. Year of manufacture (if unable to determine, approximate age),

~~VI~~6. Rated Brake Horsepower Rating,

~~VII~~7. Exhaust stack height from ground,

~~VIII~~8. Engine Emission Factors and supporting data for PM, NOx and NMHC separately or NMHC+NOx, and CO, (if available) from manufacturers data, source tests, or other sources (specify),

~~IX~~9. Diameter of stack outlet,

~~X~~10. Direction of outlet (horizontal or vertical),

~~XI~~11. End of stack (open or capped),

~~XII~~12. Control equipment (if applicable)

~~i~~a. Turbocharger,

~~ii~~b. Aftercooler,

~~iii~~c. Injection Timing Retard,

~~iv~~d. Catalyst,

~~v~~e. Diesel Particulate Filter,

~~vi~~f. Other;

~~c.~~(C) Fuel(s) Used

~~I~~1. CARB Diesel,

~~II~~2. Jet fuel,

~~III~~3. Diesel,

~~IV~~4. Alternative diesel fuel (specify),

~~V~~5. Alternative fuel (specify),

~~VI~~6. Combination (Dual fuel) (specify),

~~VII~~7. Other (specify);

~~d.~~(D) Operation Information, including:

~~I~~1. Describe general use of engine,

~~II~~2. Typical load (percent of maximum bhp rating),

~~III~~3. Typical annual hours of operation,

~~IV~~4. If seasonal, months of year operated and typical hours per month operated,

~~V~~5. Fuel usage rate (if available);

~~e.~~(E) Receptor Information, including:

~~I~~1. Nearest receptor description (receptor type),

~~II~~2. Distance to nearest receptor (feet or meters),

~~III~~3. Distance to nearest school grounds;

~~f.~~(F) A statement ~~State~~ whether the engine is included in an existing AB 2588 emission inventory.

~~4.~~(4) Except as provided in ~~sub~~section ~~(c)~~93115.3, ~~and~~ no later than 180 days prior to the earliest applicable compliance date specified in ~~sub~~sections ~~(f)~~93115.11 or ~~(g)~~93115.12, each owner or operator of an in-use stationary diesel-fueled CI engine greater than 50 brake horsepower (> 50 bhp) shall provide the following additional information to the District APCO: an identification of the control strategy for each stationary diesel-fueled CI engine that when implemented will result in compliance with ~~sub~~sections ~~(e)(2)~~ 93115.6 and 93115.7. If applicable, the information should include the Executive Order number issued by the Executive Officer for a Diesel Emission Control Strategy that has been approved by the Executive Officer through the Verification Procedure.

~~5.~~(5) ~~The District~~ An APCO may exempt the owner or operator from providing all or part of the information identified in ~~sub~~sections ~~(e)(4)(A)3. or (e)(4)(A)4.~~ 93115.10(a)(3) or (4) if there is a current record of the information in the owner or operator's permit to operate, permit application, District registration program, or other District records.

~~6.~~(6) Upon ~~the~~ written request by the Executive Officer, ~~the District~~ an APCO shall provide to the Executive Officer a written report of all information identified in ~~sub~~sections ~~(e)(4)(A)3. and (e)(4)(A)4~~93115.10(a)(3) and (4).

~~(B) Reporting Requirements for Sellers of New Emergency Standby or Stationary Prime Diesel-Fueled CI Engines (> 50 bhp) Sold To Agricultural Operations~~

~~1. Except as provided by subsection (c), by January 31, 2006 and January 31st of each year thereafter, any person who sells a stationary diesel-fueled CI engine having a rated brake horsepower greater than 50 for use in an agricultural operation shall provide the following information for the previous calendar year (January 1st through December 31st) to the Executive Officer of the Air Resources Board:~~

~~a. Contact Information~~

~~I. Seller's Company Name (if applicable);~~

~~II. Contact name, phone number, e-mail address;~~

~~b. Engine Sales Information (for each engine sold for use in California in the previous calendar year)~~

~~I. Make,~~

~~II. Model,~~

~~III. Model year (if known),~~

~~IV. Rated brake horsepower,~~

~~V. Number of engines sold,~~
~~VI. Certification executive order number (if applicable),~~
~~VII. Engine family number (if known),~~
~~VIII. Emission control strategy (if applicable).~~

(~~C~~b) Reporting Requirements for Sellers of Stationary Diesel-Fueled CI Engines Having a Rated Brake Horsepower Less Than or Equal to 50 (≤ 50 bhp)

~~1.~~(1) Except as provided in ~~sub~~section ~~(c)~~93115.3, no later than ~~by~~ January 31, 2006 and by January 31st of each year thereafter, all sellers of stationary diesel fueled CI engines sold for use in California that have a rated brake horsepower less than or equal to 50 shall provide the following information for the previous calendar year ~~(January 1st through December 31st)~~ to the Executive Officer of the Air Resources Board:

~~a.~~(A) Contact Information

~~I~~1. Sellers Company Name (if applicable);

~~II~~2. Contact name, phone number, e-mail address;

~~b.~~(B) Engine Sales Information (for each engine sold for use in California in the previous calendar year)

~~I~~1. Make,

~~II~~2. Model,

~~III~~3. Model year (if known),

~~IV~~4. Rated brake horsepower,

~~V~~5. Number of engines sold,

~~VI~~6. Certification executive order number (if applicable),

~~VII~~7. Engine family number (if known),

~~VIII~~8. Emission control strategy (if applicable)~~.~~,

9. Hours on nonresettable hour meter when delivered to end-user (if applicable).

(~~D~~c) Demonstration of Compliance with Emission Limits

~~1.~~(1) Prior to the installation of a new stationary diesel-fueled CI engine at a facility, the owner or operator of the new stationary diesel-fueled CI engine(s) subject to the requirements of section ~~(e)(2)(A)3., (e)(2)(A)4., (e)(2)(C)1, (e)(2)(E)1, or (e)(2)(F)1.c~~ 93115.6(a)(3), 93115.6(a)(4), 93115.6(c)(1)(C), and 93115.7(a)(1) shall provide emission data to the District APCO in accordance with the requirements of ~~sub~~section ~~(h)~~ 93115.13 for purposes of demonstrating compliance.

~~2.~~(3) By no later than the earliest applicable compliance date specified in ~~sub~~sections ~~(f)~~93115.11 or ~~(g)~~93115.12, the owner or operator of an in-use stationary diesel-fueled CI engine(s) subject to the requirements of ~~sub~~section ~~(e)(2)(B)3., (e)(2)(D)1, or (e)(2)(F)2.c~~93115.6(b)(3), 93115.6(c)(2)(C), or 93115.7(b)(1) shall provide emissions and/or operational data to the District APCO in accordance with the requirements of ~~sub~~section ~~(h)~~93115.13 for purposes of demonstrating compliance.

~~(E) Notification of Non-Compliance~~
~~Owners or operators who have determined that they are operating their stationary diesel-fueled engine(s) in violation of the requirements specified in sections (e)(1) or (e)(2) shall notify the district APCO immediately upon detection of the violation and shall be subject to district enforcement action.~~

(~~F~~d) Notification of Loss of Exemption

~~1.~~(1) Owners or operators of in-use stationary diesel-fueled CI engines, who are ~~subject to~~ operating under an exemption specified in ~~sub~~sections ~~(c)~~93115.3 or ~~(e)(2)(E)2.~~93115.8(a)(2) from all or part of the requirements of subsections ~~(e)(2)~~93115.6, 93115.7, or 93115.8 shall notify the ~~d~~District APCO within five days ~~immediately~~ after they become aware that the exemption no longer applies. and~~No later than 180 days after notifying the APCO, the owner or operator~~ shall demonstrate compliance with the applicable requirements of ~~subsection (e)(2):~~

(A) section 93115.6 or 93115.7, no later than 180 days after the date the exemption no longer applies; or

(B) section 93115.8, no later than 18 months after the date the exemption no longer applies or no later than 18 months after the emission standard compliance date set forth in section 93115.8, whichever is later.

~~An owner or operator of an in-use stationary diesel-fueled CI engine(s) subject to the requirements of section (e)(2) shall provide emission data to the District APCO in accordance with the requirements of subsection (h) for purposes of demonstrating compliance.~~

~~2~~(2) ~~The~~ A District APCO shall notify owners or operators of in-use stationary diesel-fueled CI engines, ~~who are subject to the~~ operating under an exemption specified in ~~sub~~section ~~(c)(9)~~93115.3(g) from the requirements of ~~sub~~sections~~(e)(1)~~ 93115.5 and sections ~~(e)(2)~~ 93115.6, 93115.7, or 93115.8, when the exemption no longer applies. and ~~No later than 180 days after notification by the District APCO,~~ the owner or operator shall demonstrate compliance with the applicable requirements of ~~subsections (e)(1) and (e)(2):~~

(A) section 93115.5, 93115.6, or 93115.7, no later than 180 days after notification by the District APCO; or

(B) section 93115.8, no later than 18 months after notification by the District APCO or no later than 18 months after the emission standard compliance date set forth in section 93115.8, whichever is later.

(3) An owner or operator of an in-use stationary diesel-fueled CI engine(s) subject to the requirements of ~~sub~~sections ~~(e)(2)~~93115.6, 93115.7, or 93115.8 shall provide emissions data to the District APCO in accordance with the requirements of ~~sub~~section ~~(h)~~93115.13 for purposes of demonstrating compliance pursuant to section 93115.10(d)(1) or (2).

(~~G~~e) Monitoring Equipment

~~1.~~(1) A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed upon engine installation, or by no later than January 1, 2005, on all engines subject to all or part of the requirements of ~~sub~~sections ~~(e)(2)~~93115.6, 93115.7, or 93115.8(a) unless the District determines on a case-by-case basis that a non-resettable hour meter with a different minimum display capability is appropriate in consideration of the historical use of the engine and the owner or operator's compliance history.

~~2.~~(2) All DPFs installed pursuant to the requirements in ~~sub~~sections ~~(e)(2)~~ 93115.6, 93115.7, or 93115.8(a) must, upon engine installation or by no later than January 1, 2005, be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached.

~~3.~~(3) The District APCO may require the owner or operator to install and maintain additional monitoring equipment for the particular emission control strategy(ies) used to meet the requirements of ~~sub~~sections ~~(e)(2)~~93115.6, 93115.7, or 93115.8(a).

(~~H~~f) Reporting Provisions for Exempted Agricultural Emergency, Remotely-Located Agricultural, Prime, and Nonagricultural Emergency Engines

An owner or operator of an engine subject to ~~sub~~sections ~~(c)(6)~~93115.3(a), 93115.3(d), or ~~(c)(12)~~93115.3(j) shall keep records of the number of hours the engines are operated on a monthly basis. Such records shall be retained for a minimum of 36 months from the date of entry. Record entries made within 24 months of the most recent entry shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request. Record entries made from 25 to 36 months from the most recent entry shall be made available to District staff within 5 working days from the district's request.

(~~I~~g) Reporting Requirements for Emergency Standby Engines

~~1.~~(1) Starting January 1, 2005, each owner or operator of an emergency standby diesel-fueled CI engine shall keep records and prepare a monthly summary ~~log of usage~~that shall list and document the nature of use for each of the following:

~~a.~~(A) emergency use hours of operation;

~~b.~~(B) maintenance and testing hours of operation;

~~c.~~(C) hours of operation for emission testing to show compliance with ~~sub~~sections ~~(e)(2)(A)3.~~93115.6(a)(3) and ~~(e)(2)(B)3.~~93115.6(b)(3);

~~d.~~(D) initial start-up testing hours;

~~e.~~(E) if applicable, hours of operation to comply with the requirements of NFPA 25;

~~f.~~(F) hours of operation for all uses other than those specified in ~~sub~~sections ~~(e)(4)(I)1.a through (e)(4)(I)1.d.~~93115.10(g)(1)(A) through (D) above; and

~~g.~~(G) the fuel used.

1. For engines operated exclusively on CARB Diesel Fuel, the owner or operator shall document the use of CARB Diesel Fuel through the retention of fuel purchase records indicating that the only fuel purchased for supply to an emergency standby engine was CARB Diesel Fuel; or
2. For engines operated on any fuel other than CARB Diesel Fuel, fuel records demonstrating that the only fuel purchased and added to an emergency standby engine or engines, or to any fuel tank directly attached to an emergency standby engine or engines, meets the requirements of section 93115.5(b).~~for in-use emergency standby diesel fueled engines, the fuel used. The owner or operator shall document fuel use through the retention of fuel purchase records that account for all fuel used in the engine and all fuel purchased for use in the engine, and, at a minimum, contain the following information for each individual fuel purchase transaction:~~
   - ~~I~~1. ~~identification of the fuel purchased as either CARB Diesel, or an alternative diesel fuel that meets the requirements of the Verification Procedure, or an alternative fuel, or CARB Diesel fuel used with additives that meet the requirements of the Verification Procedure, or any combination of the above;~~
   - ~~II~~2. ~~amount of fuel purchased;~~
   - ~~III~~3. ~~date when the fuel was purchased;~~
   - ~~IV~~4. ~~signature of owner or operator or representative of owner or operator who received the fuel; and~~
   - ~~V~~5. ~~signature of fuel provider indicating fuel was delivered.~~

~~2.~~(2) Records ~~of Log entries~~ shall be retained for a minimum of 36 months ~~from the date of entry~~. ~~Log entries made within~~Records for the prior 24 months ~~of the most recent entry~~ shall be retained on-site, either at a central location or at the engine's location, or at an offsite central location within California, and shall be made immediately available to the District staff upon request. ~~Log entries made from~~ Records for the prior 25 to 36 months ~~from most recent entry~~ shall be made available to District staff within 5 working days from request.

(~~J~~h) Reporting Requirements for the San Diego Gas and Electric Company Regarding the RBRP

~~1.~~(1) The San Diego Gas and Electric Company shall provide to the San Diego County Air Pollution Control District the following information, by January 31, 2005, to the extent the District does not already have the information:

~~a.~~(A) For each diesel-fueled engine enrolled in the RBRP:

- ~~I~~1. Owner's Company Name (if applicable);
- ~~II~~2. Contact name, phone number, e-mail address;

~~III~~3. Load reduction capacity of engine, which is the rated brake horsepower expressed in megawatts (megawatts); and

~~IV~~4. Diesel PM emission rate of the engine (g/bhp-hr);

~~b.~~(B) The San Diego Gas and Electric Company shall update the information as necessary to reflect the current inventory of RBRP engines and provide the updated information to the SDAPCD upon request.

~~2.~~(2) The San Diego Gas and Electric Company shall provide the San Diego County Air Pollution Control District with an environmental dispatch protocol for the RBRP that meets all of the following requirements:

~~a.~~(A) The protocol shall require the San Diego Gas and Electric Company to dispatch engines in an order that protects public health, with consideration given to factors including, but not limited to, diesel PM emission rate, location, and other factors to be determined by the District; and

~~b.~~ (B) The protocol shall require the San Diego Gas and Electric Company to identify and report to the District the specific engines called for dispatch within 1 day of the dispatch; and

~~c.~~(C) The protocol shall require the San Diego Gas and Electric Company to report the following information to the District, within 30 days of the dispatch:

~~I~~1. Identification of engine dispatched;

~~II~~2. Load capacity of engine dispatched;

~~III~~3. Cumulative total of load capacity of engines dispatched (megawatts); and

~~IV~~4. Cumulative total of diesel PM emission rate of engines dispatched (g/hr).

~~d.~~(D) Within 30 calendar days of receiving the environmental dispatch protocol, or a time period mutually agreed by the parties, the District APCO shall approve or disapprove the protocol.

(~~K~~i) Additional Reporting Requirements for the Stationary Emergency Standby Diesel-Fueled CI Engines Used To Fulfill the Requirements of an Interruptible Service Contract (ISC)

~~1.~~(1) The owner or operator of an ISC engine shall provide to the District the following information, as necessary to the extent the District does not already have the information:

~~a.~~(A) For each diesel-fueled engine enrolled in the ISC:

~~I~~1. Owner's Company Name (if applicable);

~~II~~2. Contact name, phone number, e-mail address; and

~~III~~3. Diesel PM emission rate of the engine (g/bhp-hr).

~~b.~~(B) For engines enrolled in an ISC prior to January 1, 2005, the information identified in ~~(e)(4)(K)1.a.~~93115.10(i)(1)(A) shall be provided to the District by January 31, 2005; and

~~c.~~(C) For engines enrolled in an ISC after January 1, 2005, the

information identified in ~~(e)(4)(K)1.a.~~93115.10(i)(1)(A) shall be provided to the District no later than 30 days after the engine is enrolled in an ISC.

The owner or operator shall update the information as necessary to reflect the current inventory of ISC engines and shall provide the updated information to the District upon request.

~~(f) Compliance Schedule for Owners or Operators of Three or Fewer Engines (> 50 bhp) Located within the District~~

93115.11 Compliance Schedule for Owners or Operators of Three or Fewer Engines (>50 bhp) Located within ~~the~~ a District

(~~1~~a) All owners and operators of three or fewer engines located within ~~the~~ a District, who will meet the requirements of ~~sub~~sections ~~(e)(2)(B)~~93115.6(b) solely by maintaining or reducing the current annual hours of operation for maintenance and testing, shall be in compliance with the annual hours of operation limits beginning January 1, 2006.

(~~2~~b) All owners and operators of three or fewer engines located within ~~the~~ a District, which are not in compliance with~~subject to sub~~section ~~(f)(1)~~93115.11(a) but are required to meet the requirements of ~~sub~~sections ~~(e)(2)(B)~~93115.6(b) or ~~(e)(2)(D)~~93115.7(b), shall comply with section 93115.6(b) or 93115.7(b), whichever applies, according to the following schedule:~~meet these requirements in accordance with the following schedule:~~

(A1) All pre-1989 through 1989 model year engines, inclusive, shall be in compliance by no later than January 1, 2006;

(~~B~~2) All 1990 through 1995 model year engines, inclusive, shall be in compliance by no later than January 1, 2007; and

(~~C~~3) All 1996 and later model year engines shall be in compliance by no later than January 1, 2008.

~~(g) Compliance Schedule for Owners or Operators of Four or More Engines (> 50 bhp) Located within the District~~

93115.12 Compliance Schedule for Owners or Operators of Four or More Engines (>50 bhp) Located within a District

(~~1~~a) All owners and operators of four or more engines located within ~~the~~ a District, who will meet the requirements of ~~sub~~sections ~~(e)(2)(B)~~93115.6(b) solely by maintaining or reducing the current annual hours of operation for maintenance and testing, shall be in compliance with the annual hours of operation limits beginning January 1, 2006.

(~~2~~b) All owners and operators of four or more engines located within ~~the~~ a District, who are not in compliance with section 93115.12(a) but are required to meet the requirements of sections 93115.6(b) or 93115.7(b),~~subject to the requirements of subsections (e)(2)(B) or (e)(2)(D) and who are not required to meet the compliance date~~

~~specified in (g)(1),~~ shall comply with sections ~~(e)(2)(B)~~93115.6(b) or ~~(e)(2)(D)~~ 93115.7(b), whichever applies, according to the following schedule:

Pre-1989 Through 1989 Model Year Engines, Inclusive

Percent of Engines	Compliance date
50%	January 1, 2007
75%	January 1, 2008
100%	January 1, 2009

1990 through 1995 Model Year Engines, Inclusive

Percent of Engines	Compliance date
30%	January 1, 2007
60%	January 1, 2008
100%	January 1, 2009

1996 and Later Model Year Engines

Percent of Engines	Compliance date
50%	January 1, 2008
100%	January 1, 2009

~~(h) Emissions Data~~*93115.13 Emissions Data*

(~~1~~a) Upon approval by the District APCO, or the Executive Officer the following sources of data may be used in whole or part to meet the emission data requirements of ~~sub~~sections ~~(e)(2)(A) through (e)(2)(F)~~93115.6 through 93115.9:

(~~A~~1) off-road engine certification test data for the stationary diesel-fueled CI engine,

(~~B~~2) engine manufacturer test data,

(~~C~~3) emissions test data from a similar engine, or

(~~D~~4) emissions test data used in meeting the requirements of the Verification Procedure for the emission control strategy implemented.

(~~2~~b) Emissions testing of a stationary diesel-fueled CI engine, for purposes of showing compliance with the requirements of ~~sub~~sections ~~(e)(2)(A) through (e)(2)(F)~~93115.6 through 93115.9, shall be done in accordance with the methods specified in ~~sub~~section ~~(i)~~93115.14.

(~~3~~c) For purposes of emissions testing, the particulate matter (PM) emissions from a dual-fueled stationary CI engine, which uses as its fuel a mixture of diesel fuel and other fuel(s), shall be deemed to be 100% diesel PM.

(4d) Emissions testing for the purposes of determining the percent change from baseline shall include baseline and emission control strategy testing subject to the following conditions:

(~~A~~1) Baseline testing may be conducted with the emission control strategy in place, provided the test sample is taken upstream of the emission control

strategy and the presence of the emission control strategy is shown to the District APCO's, satisfaction as having no influence on the emission test results;

(~~B~~2) Control strategy testing shall be performed on the stationary diesel-fueled CI engine with full implementation of the emission control strategy;

(~~C~~3) The percent change from baseline shall be calculated as the baseline emissions minus control strategy emissions, with the difference being divided by the baseline emissions and the result expressed as a percentage; and

(~~D~~4) The same test method shall be used for determining both baseline emissions and control strategy emissions.

(~~5~~e) Emission testing for the purposes of demonstrating compliance with an emission level shall be performed on the stationary diesel-fueled CI engine with the emission control strategy fully implemented.

~~(i) Test Methods~~*93115.14 Test Methods*

(~~1~~a) The following test methods shall be used to determine diesel PM, HC, NOx, CO and NMHC emission rates:

(~~A~~1) Diesel PM emission testing shall be done in accordance with one of the following methods:

~~1.~~(A) California Air Resources Board Method 5 (ARB Method 5), "Determination of Particulate Matter Emissions from Stationary Sources," as amended July 28, 1997, which is incorporated herein by reference.

~~a~~1. For purposes of this subsection, diesel PM shall be measured only by the probe catch and filter catch and shall not include PM captured in the impinger catch or solvent extract.

~~b~~2. The tests are to be carried out under steady state operation. Test cycles and loads shall be in accordance with ISO-8178 Part 4 or alternative test cycle approved by the District APCO.

~~c~~3. The District APCO may require additional engine or operational duty cycle data if an alternative test cycle is requested; or

~~2.~~(B) International Organization for Standardization (ISO) 8178 Test procedures: ISO 8178-1:1996(E) ("ISO 8178 Part 1") ISO 8178-2: 1996(E) ("ISO 8178 Part 2"); and ISO 8178-4:1996(E) ("ISO 8178 Part 4"), which are incorporated herein by reference; or

~~3.~~(C) Title 13, California Code of Regulations, section 2423, "Exhaust Emission Standards and Test Procedures - Off-Road Compression Ignition Engines," which is incorporated herein by reference.

(~~B~~2) NOx, CO and HC emission testing shall be done in accordance with one of the following methods:

~~1.~~(A) California Air Resources Board Method 100 (ARB Method 100), "Procedures for Continuous Gaseous Emission Stack Sampling," as amended July 28, 1997, which is incorporated herein by reference.

a1. Tests using ARB Method 100 shall be carried out under steady state operation. Test cycles and loads shall be in accordance with ISO-8178 Part 4 or alternative test cycle approved by the District APCO.

b2. The District APCO may require additional engine or operational duty cycle data if an alternative test cycle is requested; or

2.(B) International Organization for Standardization (ISO) 8178 Test procedures: ISO 8178-1:1996(E) ("ISO 8178 Part 1") ISO 8178-2: 1996(E) ("ISO 8178 Part 2"); and ISO 8178-4:1996(E) ("ISO 8178 Part 4"), which are incorporated herein by reference; or

3.(C) Title 13, California Code of Regulations, section 2423, "Exhaust Emission Standards and Test Procedures - Off-Road Compression Ignition Engines," which is incorporated herein by reference.

(C3) NMHC emission testing shall be done in accordance with one of the following methods:

1.(A) International Organization for Standardization (ISO) 8178 Test procedures: ISO 8178-1:1996(E) ("ISO 8178 Part 1") ISO 8178-2:1996(E) ("ISO 8178 Part 2"); and ISO 8178-4:1996(E) ("ISO 8178 Part 4"), which are incorporated herein by reference; or

2.(B) Title 13, California Code of Regulations, section 2423, "Exhaust Emission Standards and Test Procedures - Off-Road Compression Ignition Engines," which is incorporated herein by reference.

(2b) The District APCO may approve the use of alternatives to the test methods listed in subsection (i)(1)93115.14(a), provided the alternatives are demonstrated to the APCO's satisfaction as accurate in determining the emission rate of diesel PM, HC, NOx, NMHC, or CO.

(j) Severability*93115.15 Severability*

Each part of this sectionATCM shall be deemed severable, and in the event that any part of this sectionATCM is held to be invalid, the remainder of this sectionATCM shall continue in full force and effect.

NOTE: Authority cited: Sections 39600, 39601, 39650, 39658, 39659, 39665, 39666, 41511, and 43013, Health and Safety Code. Reference: Sections 39002, 39650, 39658, 39659, 39665, 39666, 40000, 41511, and 43013, Health and Safety Code.

Appendix B

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LIST OF PROPOSED AMENDMENTS

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
Purpose	(a)	93115.1	This section has been renumbered as indicated (see note above).
Applicability	(b)	93115.2	This section has been renumbered as indicated (see note above).
	(b)(1)	93115.2(a)	This change and the deletion of sections (c)(1) and (2) of the existing ATCM clarify that the ATCM does not apply to specified portable, motive power, marine, and agricultural wind machine CI engines. For further discussion about the applicability of agricultural wind machines, see Chapter IV of the Staff Report.
	(b)(2)	93115.2(b)	This change clarifies that the ATCM does apply to less than 50 bhp new stationary diesel CI engines. Less than 50 bhp stationary diesel engines are subject to the emission limits in section 93115.9, designated as section (e)(3) in the existing ATCM.
	(b)(3)		This section has been deleted because it is redundant with respect to Health and Safety Code Section 39666(d)
Exemptions	(c)	93115.3	This section has been renumbered as indicated (see note above).
	(c)(1) and (c)(2)		The exemptions for portable, motive power, and marine engines have been deleted. They are no longer necessary as a result of the change to section 93115.2(a), designated as section (b)(1) in the existing ATCM, which indicates that the ATCM does not apply to specified portable, motive power, and marine CI engines.
	(c)(3)	93115.3(a)	This change clarifies that in-use stationary diesel agricultural engines per se are no longer exempt from ATCM requirements. However, a limited exemption from in-use emission standards has been proposed for agricultural emergency standby generator set engines and remotely-located agricultural engines provided they are equipped with hour meters and meet registration and recordkeeping requirements. For further discussion of these exemptions, see Chapter IV of the Staff Report.
	(c)(4)	93115.3(b)	This change clarifies that in-use, as well as new, stationary diesel-fueled agricultural engines are exempt from section 93115.6 and 93115.7 emergency standby engine and prime

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Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
			engine standards, designated as section (e)(2)(A) through (D) in the existing ATCM, and section 93115.10(a) reporting requirements, designated as section (e)(4)(A) in the existing ATCM. See section 93115.8(c) of the ATCM and Chapter IV of the Staff Report for a discussion of new and in-use stationary diesel-fueled agricultural engine registration requirements that address reporting for these engines.
	(c)(13)	93115.3(k)	This change clarifies that the exemption for dual-fuel pilot engines that use alternative fuels or alternative diesel fuels applies to in-use stationary agricultural, as well as emergency standby or prime, dual-fuel pilot engines.
	(c)(14)	93115.3(l)	This change clarifies that the exemption for dual-fuel pilot engines that use digester or landfill gas also applies to stationary agricultural, as well as emergency standby and prime, engines.
	(c)(15)	93115.3(m)	This change clarifies that in-use stationary diesel-fueled agricultural engines equipped with selective catalytic reduction systems are exempt from emission standard requirements consistent with the exemption for similarly-equipped in-use stationary diesel-fueled emergency standby and prime engines.
	(c)(16)	93115.3 (n)	This change was made to update the reference to the 1998 edition of the National Fire Protection Association (NFPA) 25 "Standards for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems" to the new 2006 edition. This change also authorizes the Executive Officer of the ARB to update this reference as new editions are published.
		93115.3(s)	This new exemption provides sellers and owner/operators of new stock engines the flexibility to sell or use (as appropriate) inventory that does not meet a new more stringent emission standard provided certain conditions are met. This exemption has been characterized as a "sell-through" provision. For further discussion on this exemption, see Chapter IV of the Staff Report.
		93115.3 (t)	This new section provides the U.S. Department of Defense an exemption from the requirements of section 93115.6(b)(3) until December 31, 2009 for their emergency standby engines located

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
			at Command Destruct (CT) sites. Section 93115.6(b)(3) requirements are summarized in the ATCM's Table 2: Summary of the Emission Standards and Operating Requirements for In-Use Stationary Emergency Standby Diesel-Fueled CI Engines.
		93115.3 (u)	This change provides air districts with discretionary authority to exempt specified stationary CI test cell or test stand engines or specified stationary CI engines used at research and development facilities or at educational facilities for training. This change will allow such engines to fulfill their experimental and/or educational purposes without notices of violation.
Definitions	(d)	93115.4	This section has been renumbered as indicated (see note above).
		93115.4(b)	A definition of "Agricultural Wind Machine" has been added to clearly identify such equipment. In accordance with revised section 93115.2(a), designated as section (b)(1) in the existing ATCM, the ATCM does not apply to stationary diesel engines used to power agricultural wind machines.
	(d)(2)	93115.4(c)	This change clarifies that the definition of "Air Pollution Control Officer (APCO)" is associated with the person appointed pursuant to Health and Safety Code section 40750 (or his or her designee).
	(d)(4)	93115.4 (e)	This change was made to clarify that biodiesel blends that do not meet the definition of CARB diesel are considered an alternative diesel fuel.
	(d)(7)	93115.4 (h)	This change was made to make the definition of CARB diesel fuel consistent with ARB fuel regulations.
		93115.4(k)	A definition of "Certified Engine" has been added to clearly identify the Tier 1- and Tier 2-certified engines to which new section 93115.8(b)(3) applies. For further discussion of Tier 1- and Tier 2-certified in-use stationary diesel-fueled agricultural engine requirements, see Chapter IV of the Staff Report.
		93115.4(q)	A definition of "Date of Initial Installation" has been added to clarify the compliance requirements for Tier 1- and Tier 2-certified in-use stationary diesel agricultural engines subject to section 93115.8(b)(3). For further discussion of the compliance requirements for such engines, see Chapter IV of the Staff Report.

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Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
	(d)(25)(G)	93115.4(dd)(7)	This subsection was amended to clarify that any day of launch system checks and launch tracking performed at CT sites by emergency standby engines were considered as emergency use hours of operation. Further, these activities must occur within the 24-hour time period associated with the scheduled time of launch.
	(d)(27)	93115.4(ff)	The definition of "End User" has been changed to clarify that persons who acquire engines only to resell them are not engine "end users" for the purposes of the ATCM.
		93115.4 (uu)(4)	This change was made to provide air districts with discretionary approval to not count the additional hours of testing required when engine failure or breakdown occurs during routine maintenance and testing operations.
	(d)(44)(A)4.	93115.4(xx)(D)	This change was made to clarify that a stationary diesel agricultural engine that is moved to another site is not considered a "new" engine unless the owner/operator of the engine and facility has changed. For further discussion, see Chapter IV of the Staff Report.
	(d)(44)	93115.4(xx)(G)	Subsection 93115.4(xx)(G) has been added to the definition of "New CI Engine" to clarify that new Tier 1- and Tier 2-certified stationary diesel agricultural engines must comply with in-use standards if such engines are to be operated beyond the compliance dates set forth in section 93115.8(b)(3).
		93115.4(zz)	A definition of "Noncertified Engine" has been added to clearly identify the engines to which new section 93115.8(b)(2) applies. For further discussion of noncertified in-use stationary diesel agricultural engine requirements, see Chapter IV of the Staff Report.
		93115.4(kkk)	A definition for "Remotely-Located Agricultural Engine" has been added to clarify the applicability of the remotely-located agricultural engine exemption. For further discussion about this exemption, see Chapter IV of the Staff Report.
		93115.4(lll)	A definition for "Residential Area" has been added to clarify the type of area of concern for the purposes of section 93115.8(c) stationary diesel-fueled agricultural registration submittal.

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
	(d)(56)	93115.4(mmm)	This change clarifies that the "Rolling Blackout Reduction Program" consists of the latest set of elements for such program approved by the California Public Utilities Commission (PUC). The definition no longer specifies values, percentages, or minimum reductions in capacity because these elements are subject to change by the PUC.
		93115.4(vvv)	A definition of "Stock Engine" has been added to clarify the type of engine that may be exempted per section 93115.3(s).
	(d)(69)	93115.4(aaaa)	The change to the definition of "Verified Diesel Emission Control Strategy" clarifies that the verification procedure is pursuant to title 13, California Code of Regulations, section 2700.
Requirements	(e)		This section has been subdivided to make it easier to locate requirements per type of engine or type of requirement.
(Fueling)	(e)(1)	93115.5	This section has been renumbered as indicated (see note above).
	(e)(1)(A)(2)	93115.5(a)(2) and (3)	These sections have been changed to clarify the alternative diesel fuels that are considered appropriate to add to the fuel tanks of stationary new and in-use prime engines and new agricultural engines.
	(e)(1)(B)(2)	93115.5(b)(2) and (3)	These sections have been changed to clarify the alternative diesel fuels that are considered appropriate to add to the fuel tanks of nonagricultural stationary new and in-use emergency standby engines.
		93115.5(c)	Consistent with the fueling requirements for other stationary diesel-fueled engines, this section adds fueling requirements for stationary diesel-fueled agricultural engines. For further discussion, see Chapter IV of the Staff Report.
(Emergency Standby Engines)	(e)(2)(A),(B), and (F)	93115.6(a),(b), and (c)	This section has been renumbered as indicated (see note above).
	(e)(2)(A)(3)a.II.	93115.6 (a)(3)(A)2.	This change was made to provide an additional compliance option to meet the ≤ 0.01 g/bhp-hr diesel PM emission standard for new and in-use prime and emergency standby engines. Table 1: Summary of the Emission Standards and Operating Requirements for New Stationary Emergency Standby Diesel-Fueled CI Engines

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
			>50 bhp also contains the verbiage for this alternative compliance option.
	(e)(2)(B)(3)a.II.iii.	93115.6 (b)(3)(A)2.c.	See description for section 93115.6 (a)(3)(A)2. above. Table 2: Summary of the Emission Standards and Operating Requirements for In-Use Stationary Emergency Standby Diesel-Fueled CI Engines >50 bhp also contains the verbiage for this alternative compliance option.
	(e)(2)(F)	93115.6(c)	The operating requirements and standards for emergency standby engines used in demand response programs have been moved from section (e)(2)(F) in the existing ATCM to section 93115.6(c) in the proposed ATCM so that they immediately follow similar requirements for new and in-use emergency standby engines.
		93115.6(c)(1)(D)	New section added to provide new emergency standby stationary diesel-fueled CI Demand Response Program (DRP) engines with a compliance option to meet the ≤ 0.01 g/bhp-hr diesel PM emissions standard by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine (or Tier 2 engine for engines greater than 750 bhp) that meets the 0.15 g/bhp-hr PM emission standard.
		93115.6(c)(2)(D)	New section added to provide in-use stationary emergency standby diesel-fueled CI DRP engines with the same compliance option provided in 93115.6(c)(1)(D).
(Prime Engines)	(e)(2)(C) and (D)	93115.7	This section has been renumbered as indicated (see note above).
		93115.7 (a)(1)(B)	See description for section 93115.6 (a)(3)(A)2. above. Table 3: Summary of the Emission Standards and Operating Requirements for New Stationary Prime Diesel-Fueled CI Engines >50 bhp also contains the verbiage for this alternative compliance option.
		93115.7 (b)(1)(D)	See description for section 93115.6(a)(3)(A)2. above. Table 4: Summary of the Emission Standards and Operating Requirements for In-Use Prime Diesel-Fueled CI Engines >50 bhp also contains the verbiage for this alternative compliance option.
(Agricultural Engines)	(e)(2)(E)	93115.8	This section has been renumbered as indicated (see note above).
	(e)(2)(E)1.	93115.8(a)(1)	This section was changed to add an exception - see

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
			section 93115.8(a)(1(A)5. For further discussion, see Chapter IV of the Staff Report - Residual Risk Provision .
	Table 5	Table 5	The language for new stationary diesel nongenerator set engine emission limits has been changed to clarify that they are not meant to apply to new stationary diesel agricultural generator set engines outside the identified horsepower range. Also, for clarity, words replace the symbols used in Table 5: • ">" has been changed to "greater than," • "≥" has been changed to "greater than or equal to," • "<" has been changed to "less than," and • "≤" has been changed to "less than or equal to." Consistent with the Off-Road CI Engine Certification Standards (title 13, CCR, section 2423), "less than or equal to 99" hp has been changed to "less than 100 " hp and "greater than 99" hp has been changed to "greater than or equal to 100" hp. In addition, footnote 2 was added to Table 5 to provide a compliance option for meeting the 0.01 g/bhp-hr PM Off-Road Engine Certification Standard by combining a Level 3 Verified Diesel Emission Control Strategy with a certified Tier 3 engine that meets the 0.15 g/bhp-hr PM emission standard.
	(e)(2)(E)1.a.I. and II.	93115.8(a)(1)(A)1. and 2.	Consistent with the Off-Road CI Engine Certification Standards (title 13, CCR, section 2423), "less than or equal to 99" hp has been changed to "less than 100 " hp and "greater than 99" hp has been changed to "greater than or equal to 100" hp.
	(e)(2)(E)1.a. and Table 5	93115.8(a)(1)(A)3. and Table 5	This change corrects the omission of emission limits for new nongenerator stationary diesel agricultural engines greater than or equal to 175 hp.
		93115.8(a)(1)(A)5.	Section 93115.8(a)(1)(A)5. has been added because an engine meeting Tier 3 or Interim Tier 4 Off-Road CI Engine Certification Standards for PM could comply with the ATCM's new stationary diesel agricultural emission standards but still pose significant risk for nearby receptors. Staff believes such situations will occur

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
			infrequently. When they do, this section would allow local air districts to extend compliance with the ATCM provided an electric motor is installed or the engine meets Tier 4 PM certification standards (0.02 g/bhp-hr for an engine greater than 50 but less than 75 bhp or 0.01 g/bhp-hr for an engine greater than or equal to 75 bhp) no later than four years after the otherwise applicable ATCM compliance date. Staff does not anticipate any significant residual risk issues from electric motors or Tier 4 engines with such low PM emission rates. For further discussion, see Chapter IV of the Staff Report - Residual Risk Provision.
		93115.8(a)(1)(A)6.	This section was added to provide an alternative compliance option for the 0.01 g/bhp-hr PM standard as explained for section 93115.6(a)(3)(A)2.
		93115.8(b)	This section has been added to incorporate emission standards, registration, and other requirements for in-use stationary diesel agricultural engines into the ATCM. For further discussion, see Chapter IV of the Staff Report.
		Table 6	Section 93115.8(b) Table 6 has been added to summarize the emission limits and compliance dates for noncertified in-use stationary diesel agricultural engines.
		Table 7	Section 93115.8(b) Table 7 has been added to summarize the emission limits and compliance dates for Tier 1- and Tier 2 - certified in-use stationary diesel agricultural engines.
	(e)(2)(F)		Section (e)(2)(F) in the existing ATCM has been deleted. The requirements in section (e)(2)(F) of the existing ATCM have been moved to section 93115.6(c) of the proposed ATCM so that operating requirements and standards for emergency standby engines used in demand response programs immediately follow similar requirements for other new and in-use emergency standby engines.
(New Less Than 50 bhp Engines)	(e)(3)	93115.9	This section has been renumbered as indicated (see note above).
	Table 6	Table 8	To accommodate the addition of two tables to new section 93115.8, Table 6 in section (e)(3) of the existing ATCM has been

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
			redesignated as Table 8 in section 93115.9 of the proposed amendments.
(Recordkeeping, Reporting, Monitoring)	(e)(4)	93115.10	This section has been renumbered as indicated (see note above).
	(e)(4)(A)3.d. through f.	93115.10(a)(3)(D) through (F)	Minor language changes (addition of the word "including" and replacement of "State" with "A statement") have been made to better clarify the intent of this subsection.
	(e)(4)(A)4.	93115.10(a)(4)	Minor language changes (addition of "greater than 50 brake horsepower" to explain the abbreviation ">50 bhp") have been made to better clarify the intent of this subsection.
	(e)(4)(B)		This section was deleted as no longer necessary due to the addition of agricultural engine registration requirements in section 93115.8(c). For further discussion of registration requirements, see Chapter IV of the Staff Report.
	(e)(4)(A)5.	93115.10(a)(5)	This section was changed to clarify that district registration programs and other records that provide information equivalent to that required in section 93115.10(a)/(e)(4)(A)5. (as well as permit applications and permits) may be used in lieu of the owner/operator reporting requirements of this section.
	(e)(4)(C)	93115.10(b)(1)	Minor language changes (replacement of "by" with "no later than" and addition of the word "sold") have been made to better clarify the intent of this subsection.
		93115.10(b)(9)	This section was added to clarify that engine sellers must report metered hours at delivery. This provision will help inspectors identify any hours the engine was operated before delivery to the end-user.
	(e)(4)(D)1	93115.10(c)(1)	This section has been changed to delete the reference to section (e)(2)(E)1 of the existing ATCM so that the provisions for compliance demonstration do not apply to new stationary diesel agricultural engines. This change is consistent with the staff's original intention to require sellers of new stationary diesel agricultural engines to demonstrate compliance, rather than placing that burden on the owners and operators of such engines.

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
			See July 1, 2004 15-day notice for original ATCM, Summary of Second Set of Proposed Modifications Title 17, CCR, Section 93115(c) Exemptions.
	(e)(4)(E)		This section has been deleted because of the potential for self-incrimination by owners or operators who report engine emission standard violations which are subject to civil or criminal penalties.
	(e)(4)(F)	93115.10(d)	This section has been changed to allow owners or operators five days to notify districts when an exemption no longer applies because immediate notification is not always practicable. This section has also been changed to allow owners or operators who lose exemption status for an in-use stationary diesel agricultural emergency standby or remotely-located agricultural engine up to 18 months to comply with applicable stationary diesel agricultural engine emission limits.
	(e)(4)(H)	93115.10(f)	This section has been changed to include reporting provisions for in-use stationary diesel agricultural emergency standby and remotely-located agricultural engines that are exempt from emission limits.
	(e)(4)(I)1.d.	93115.10(g)(1)(D)	The term "testing" has been added to ensure that the hours recorded are those resulting from those engine operations defined in the definition of "Initial Start-up Testing" (section 93115.4 (pp))
	(e)(4)(I)1.g and 2	93115.10(g)(1)(G) and (2)	This change clarifies that emergency standby engine fuel records need not be on an engine-by-engine basis provided they are sufficient to demonstrate that only compliant fuels are added to the fueling tanks for such engines per section 93115.5(b), designated as section (e)(1)(B) in the existing ATCM. This change recognizes that centralized fuel recordkeeping is appropriate where fuel delivery and disbursement are centralized.
Compliance for Owners or Operators of Three or Fewer Engines	(f)	93115.11	This section has been renumbered as indicated (see note above).
	(f)(2)	93115.11(b)	This change clarifies the intent of this section, in that, engines that

Provision	ATCM as Last Amended September 2005	Proposed Amendments to the ATCM	Description/Rationale
Note: All subsections and references to subsections in the existing ATCM (title 17, California Code of Regulations, section 93115) have been renumbered in order to streamline and clarify the location of requirements.			
			comply with the emission standards for in-use emergency standby engines by reducing their annual hours of operation for maintenance and testing are provided a delayed compliance schedule based on model year of the engine.
Compliance for Owners or Operators of Four or More Engines	(g)	93115.12	This section has been renumbered as indicated (see note above).
	(g)(2)	93115.12 (b)	This section was amended to make the language of this requirement consistent with a similar requirement in section 93115.11(b) (see above).
Emissions Data	(h)	93115.13	This section has been renumbered as indicated (see note above).
Test Methods	(i)	93115.14	This section has been renumbered as indicated (see note above).
Severability	(j)	93115.15	This section has been renumbered as indicated (see note above).

Appendix C

Overview of Off-Road Compression Ignition Engine Certification Standards

Overview of Off-Road Compression Ignition Engine Certification Standards in g/bhp-hr (g/kW-hr)[1]

Engine HP (KW)	Tier 1[2]					Tier 2				Tier 3				Tier 4					
	HC	NOx	CO	PM	Years	NMHC + NOx	CO	PM	Years	NMHC + NOx	CO	PM	Years	NMHC + NOx	NMHC	NOx[3]	CO	PM	Years
≥50<75 (≥37<56)	---	6.9 (9.2)	---	---	1998-2003	5.6 (7.5)	3.7 (5.0)	0.30 (0.40)	2004-2007	3.5 (4.7)	3.7 (5.0)	0.30 (0.40)	2008-2011	3.5 (4.7)	---	---	3.7 (5.0)	0.02 (0.03)	2012+
														*** OPTION ***					
														3.5 (4.7)	---	---	3.7 (5.0)	0.22 (0.30)	2008-2012
														3.5 (4.7)	---	---	3.7 (5.0)	0.02 (0.03)	2013+
≥75<100 (≥56<75)	---	6.9 (9.2)	---	---	1998-2003	5.6 (7.5)	3.7 (5.0)	0.30 (0.40)	2004-2007	3.5 (4.7)	3.7 (5.0)	0.30 (0.40)	2008-2011	3.5 (4.7)	0.14 (0.19)	0.30-2.5 (0.40-3.4)	3.7 (5.0)	0.01 (0.02)	2012-2014
														---	0.14 (0.19)	0.30 (0.40)	3.7 (5.0)	0.01 (0.02)	2015+
≥100<175 (≥75<130)	---	6.9 (9.2)	---	---	1997-2002	4.9 (6.6)	3.7 (5.0)	0.22 (0.30)	2003-2006	3.0 (4.0)	3.7 (5.0)	0.22 (0.30)	2007-2011	3.0 (4.0)	0.14 (0.19)	0.30-2.5 (0.40-3.4)	3.7 (5.0)	0.01 (0.02)	2012-2014
														---	0.14 (0.19)	0.30 (0.40)	3.7 (5.0)	0.01 (0.02)	2015+
≥175<300 (≥130<225)	0.97 (1.3)	6.9 (9.2)	8.5 (11.4)	0.40 (0.54)	1996-2002	4.9 (6.6)	2.6 (3.5)	0.15 (0.20)	2003-2005	3.0 (4.0)	2.6 (3.5)	0.15 (0.20)	2006-2010	3.0 (4.0)	0.14 (0.19)	0.30-1.5 (0.40-2.0)	2.6 (3.5)	0.01 (0.02)	2011-2013
														---	0.14 (0.19)	0.30 (0.40)	2.6 (3.5)	0.01 (0.02)	2014+
≥300<600 (≥225<450)	0.97 (1.3)	6.9 (9.2)	8.5 (11.4)	0.40 (0.54)	1996-2000	4.8 (6.4)	2.6 (3.5)	0.15 (0.20)	2001-2005	3.0 (4.0)	2.6 (3.5)	0.15 (0.20)	2006-2010	3.0 (4.0)	0.14 (0.19)	0.30-1.5 (0.40-2.0)	2.6 (3.5)	0.01 (0.02)	2011-2013
														---	0.14 (0.19)	0.3.0 (0.40)	2.6 (3.5)	0.01 (0.02)	2014+
≥600≤750 (≥450≤560)	0.97 (1.3)	6.9 (9.2)	8.5 (11.4)	0.40 (0.54)	1996-2001	4.8 (6.4)	2.6 (3.5)	0.15 (0.20)	2002-2005	3.0 (4.0)	2.6 (3.5)	0.15 (0.20)	2006-2010	3.0 (4.0)	0.14 (0.19)	0.30-1.5 (0.40-0.20)	2.6 (3.5)	0.01 (0.02)	2011-2013
														---	0.14 (0.19)	0.30 (0.40)	2.6 (3.5)	0.01 (0.02)	2014+
>750 (>560)	0.97 (1.3)	6.9 (9.2)	8.5 (11.4)	0.40 (0.54)	2000-2005	4.8 (6.4)	2.6 (3.5)	0.15 (0.20)	2006-2010					---	0.30 (0.40)	2.6 (3.5)	2.6 (3.5)	0.075 (0.10)	2011-2014
														---	0.14 (0.19)	2.6 (3.5)	2.6 (3.5)	0.03 (0.04)	2015+
>750≤1200[4] (>560≤900) Gen. Only	0.97 (1.3)	6.9 (9.2)	8.5 (11.4)	0.40 (0.54)	2000-2005	4.8 (6.4)	2.6 (3.5)	0.15 (0.20)	2006-2010					---	0.30 (0.40)	2.6 (3.5)	2.6 (3.5)	0.075 (0.10)	2011-2014
														---	0.14 (0.19)	0.50 (0.67)	2.6 (3.5)	0.02 (0.03)	2015+
>1200[4] (>900) Gen. Only	0.97 (1.3)	6.9 (9.2)	8.5 (11.4)	0.40 (0.54)	2000-2005	4.8 (6.4)	2.6 (3.5)	0.15 (0.20)	2006-2010					---	0.30 (0.40)	0.50 (0.67)	2.6 (3.5)	0.075 (0.10)	2011-2014
														---	0.14 (0.19)	0.5 (0.67)	2.6 (3.5)	0.02 (0.03)	2015+

1. This table is intended as an overview. For California Exhaust Emission Standards and Test Procedures - Off-Road Compression-Ignition Engines, consult title 13, California Code of Regulations, section 2423. For federal Nonroad Compression Ignition Engine Certification Standards, consult title 40, United States Code of Federal Regulations, Chapter 1, Part 89, subpart B and Part 1039, Subpart B. California/federal certification standards for new off-road/nonroad compression ignition engines are expressed in grams per kilowatt-hour (g/kW-hr). These standard values have been converted to grams per brake horsepower-hr (g/bhp-hr) for the purposes of the ATCM and this overview. To calculate the standards in g/bhp-hr, staff assumed 1 kW-hr = 0.7457 g/bhp-hr and used the procedures for significant digits and rounding in Attachments 1 and 2.
2. Tier 1 California and federal Certification Standards are not completely aligned. For the purpose of this overview, the more stringent of the two standards has been identified.
3. Engine manufacturers have several options for complying with NOx during the transitional implementation years of Tier 4, including a "phase-in--phase-out" or alternative NOx level approach.
4. In converting 900 kW to hp, one may choose 1-3 significant digits since the zeroes are all trailing. If one chooses 1 or 2 significant digits, hp is 1200, if one chooses 3 significant digits, hp is 1210.

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--- = not specified

ATTACHMENT 1

SIGNIFICANT DIGITS

The number of significant digits in an answer to a calculation will depend on the number of significant digits in the given data, as discussed in the rules below. *Approximate* calculations (order-of-magnitude estimates) always result in answers with only one or two significant digits.

When are Digits Significant?

Non-zero digits are always significant. Thus, 22 has two significant digits, and 22.3 has three significant digits.

With zeroes, the situation is more complicated:

a. Zeroes placed before other digits are not significant; 0.046 has two significant digits.
b. Zeroes placed between other digits are always significant; 4009 kg has four significant digits.
c. Zeroes placed after other digits but behind a decimal point are significant; 7.90 has three significant digits.
d. Zeroes at the end of a number are significant only if they are behind a decimal point as in (c). Otherwise, it is impossible to tell if they are significant. For example, in the number 8200, it is not clear if the zeroes are significant or not. The number of significant digits in 8200 is at least two, but could be three or four. To avoid uncertainty, use scientific notation to place significant zeroes behind a decimal point:

8.200×10^3 has four significant digits

8.20×10^3 has three significant digits

8.2×10^3 has two significant digits

Significant Digits in Multiplication, Division, Trig. functions, etc.

In a calculation involving multiplication, division, trigonometric functions, etc., the number of significant digits in an answer should equal the least number of significant digits in any one of the numbers being multiplied, divided etc.

Thus in evaluating sin(kx), where $k = 0.097\ m^{-1}$ (two significant digits) and $x = 4.73$ m (three significant digits), the answer should have two significant digits.

Note that whole numbers have essentially an unlimited number of significant digits. As an example, if a hair dryer uses 1.2 kW of power, then 2 identical hairdryers use 2.4 kW:

1.2 kW {2 sig. dig.} × 2 {unlimited sig. dig.} = 2.4 kW {2 sig. dig.}

Significant Digits in Addition and Subtraction

When quantities are being added or subtracted, the number of *decimal places* (not significant digits) in the answer should be the same as the least number of decimal places in any of the numbers being added or subtracted.

Example:

5.67 J (two decimal places)
1.1 J (one decimal place)
0.9378 J (four decimal place)
7.7 J (one decimal place)

Keep One Extra Digit in Intermediate Answers

When doing multi-step calculations, *keep at least one more significant digit in intermediate results* than needed in your final answer.

For instance, if a final answer requires two significant digits, then carry at least three significant digits in calculations. If you round-off all your intermediate answers to only two digits, you are discarding the information contained in the third digit, and as a result the *second* digit in your final answer might be incorrect. (This phenomenon is known as "round-off error.")

The Two Greatest Sins Regarding Significant Digits

1. Writing more digits in an answer (intermediate or final) than justified by the number of digits in the data.
2. Rounding-off, say, to two digits in an intermediate answer, and then writing three digits in the final answer.

http://www.physics.uoguelph.ca/tutorials/sig_fig/SIG_dig.htm

ATTACHMENT 2

RULE FOR ROUNDING APPROXIMATE NUMBERS

"If the value of the first digit to be discarded is less than 5, retain the last kept digit with no change. If the value of the first digit to be discarded is 5 or greater, increase the last kept digit's value by one."

Cowen, Bill. Mathematics Review for Air Pollution Control - Self-Instructional Course SI:100. North Carolina State University - United States Environmental Protection Agency Cooperative Assistance Agreement CT-901889. 1994. Pages 2-1-2-9

Example 1: Assuming one significant digit, 0.014999 would be rounded to 0.01 while 0.015012 would be rounded to 0.02.

Example 2: Assuming two significant digits, 0.074571 would be rounded to 0.075, while 0.744989 would be rounded to 0.074.

Appendix D

Emission Inventory Methodology

Appendix D

Emission Inventory Methodology
Agricultural Irrigation Pumps - Diesel

(Updated August 2006)

EMISSION INVENTORY SOURCE CATEGORY
Fuel Combustion / Food and Agricultural Processing

EMISSION INVENTORY CODES (CES CODES) AND DESCRIPTION
052-042-1200-0000 Agricultural Irrigation I.C. Engines – Diesel/Distillate

INTRODUCTION

Diesel-fueled agricultural irrigation pump engines are a significant source of emissions in California, especially during the April through October growing season. The Air Resources Board (ARB) estimates that in 2005, diesel-powered agricultural irrigation pump engines were the 8th largest source of nitrogen oxides and the 21st largest source of fine particulate matter in the San Joaquin Valley. For the Sacramento Valley, irrigation pump engines are the 10th largest source of nitrogen oxides and the 22nd largest source of fine particulate matter.

Irrigation pumps are used to pump water from either wells or supply canals to the field. They are also used for a number of other purposes, such as discharging water from tailwater pits, ponds, lakes, etc. Booster pumps are used to increase the water pressure for water that has already been removed from the source by another pump.

Pump engines can be either stationary or portable. A stationary pump engine is fixed in place; a portable pump engine is one that is mounted on a mobile piece of equipment or on skids and is moved from place to place depending on the need. Both well pumps and booster pump engines can be either portable or stationary.

METHODS AND SOURCES

Emissions from the irrigation pump engines are estimated by multiplying the number of pump engines by their horsepower rating, load factor, annual operating hours, and emission factor.

The basic equation for calculating the emission of agricultural irrigation pump engines is:

$$E_y = \Sigma\, Pop * EF * Hrs * HP * \%Load$$

where

E = *pollutant specific emissions (tons per year of NOx, HC, CO_2, and diesel PM)*
y = *inventory year*
Pop = *population of diesel agricultural irrigation pump engines*
EF = *emission factor (units of g/bhp-hr)*
Hrs = *average annual use in hours*
HP = *average brake horsepower of engine*
%Load = *average engine load factor*

Population

The 2003 US Department of Agriculture Farm and Ranch Irrigation Survey (FRIS) (reference 1) stated that there are 83,216 electric or fuel-powered irrigation pumps in California, of which 12,535 (or approximately 14.1 percent) are powered with diesel engines. Assuming that well and booster pump engines are powered by the various fuels at the same relative amounts as the general pump engine population, 8,721 of the 12,535 diesel engine pumps are well pumps and the remaining 3,814 pumps are booster pumps, performing such tasks as discharging water from tailwater pits.

For inventory purposes, it is necessary to allocate pump engine populations among the various counties, air basins, and districts of California. This is normally done by one of two methods: the bottom-up method uses databases of individual pump locations to determine where in the state pumps are located; and the top-down method takes a statewide total and uses a surrogate (such as the amount of irrigated acres in a given area) to estimate the pump population in that area. The bottom-up method is usually preferred, but requires extensive databases that are often not available. The top-down method is less specific, but is a more straightforward calculation.

Because of the limited amount of data on individual pump locations, this methodology uses a hybrid approach and uses both bottom-up and top-down methods to allocate pumps (and therefore pump engines) statewide. To the extent possible, district data was used to allocate the number of stationary and portable pump engines to specific areas of the state. Where district data was not available or lacking in specificity, top-down estimates were made of pump engine locations.

Bottom-Up Inventories Used

A database of well and lift pump engines in the Sacramento Ozone Non Attainment area (reference 2) shows 1,032 pump engines in that area; Sacramento Metropolitan AQMD staff estimate an additional 132 pump engines (both stationary and portable) that were not surveyed. The Sacramento Non-Attainment area includes all of Sacramento, Solano, Yolo, and Yuba Counties, and portions of Placer and Sutter Counties. In total, it is estimated that there are 1,164 diesel irrigation pump engines in the Sacramento Non-attainment area. The 132 additional pump engines

estimated by Sacramento Metro AQMD staff were assigned to counties within the non-attainment area using the top-down methods described below.

The South Coast AQMD surveyed farm operators in their district in January 2005 and again in 2006 to determine the number and size of irrigation pump engines. Results of these surveys demonstrated that that there are 12 portable and 6 stationary diesel pump engines in the South Coast Air Basin (reference 3). For the purposes of this inventory, the portable engines were assumed to be booster pump engines and the stationary pump engines were assumed to be on well pumps. Because the survey did not include information on the specific county engines were located in, they were attributed to the counties in the South Coast Air Basin by top-down methods as described below.

Top-Down Inventories Used

Top-down methods were used to allocate pump engine populations to all remaining areas of the state. Surrogates to allocate well pump engines and booster pump engine populations were developed using 2000 U.S. Geological Survey (USGS) data on the amount of ground and surface water withdrawals (reference 4). Ground water withdrawals were used to allocate well pump engine populations. USGS data on the amount of surface water withdrawals for agriculture was used to allocate booster pump engines by county. Because some surface water irrigation is done by gravity and thus does not require any pumping of any kind (for example, in rice fields), the amount of surface water withdrawals was multiplied by the ratio of sprinkler and drip irrigation acreage to total acreage irrigated by sprinkler, drip, and surface irrigation to estimate the potential gravity irrigation for a given county. Data on irrigation acreage by type was obtained from USGS (reference 4). Although surface irrigation can be accomplished by either gravity or pumping, no comprehensive regional data was available to estimate the proportion of surface irrigation that is pumped.

For counties split between air basins or non-attainment areas, GIS data on irrigated acreage developed by the California Department of Water Resources (reference 5) was used to estimate the proportions of pump engines in the split portions of a county.

All 18 estimated pump engines in the South Coast Air Basin and the 132 additional engines in the Sacramento Non-Attainment Area were allocated to counties within the respective regions using the surrogates described above.

Estimation of the split of stationary and portable pump engines by county was done based upon a methodology developed by Booz-Allen & Hamilton for the OFFROAD model (reference 6). This methodology was based upon interviews with engine manufacturers (DDC, Caterpillar, Cummins, and Deutz) and equipment manufacturers (Stewart & Stevenson and Valley Diesel) which suggested that the majority of generator, pump, and compressor engines greater than 100 horsepower were stationary. Table D-1 defines the percentages of portable and stationary engines by horsepower that were developed as a result of this work.

Table D-1 – Portable vs. Stationary Engine Distribution

Horsepower Rating	Percent Portable	Percent Stationary
0-25	100%	0%
26-50	90	10
51-120	70	30
121-175	20	80
176-250	15	85
251-500	10	90
501-750	10	90
>750	10	90

Table D-2 (on Page D-5) summarizes the resulting pump engines population used for the emissions estimates.

Table D-2 – Estimated 2003 Diesel Agricultural Irrigation Pump Engine Population

District	Portable	Stationary	Total
Amador County APCD	5	12	17
Antelope Valley APCD	2	17	19
Bay Area AQMD	49	98	147
Butte County AQMD	183	304	487
Calaveras County AQMD	1	3	4
Colusa County APCD	98	228	327
El Dorado County APCD	4	7	11
Feather River AQMD	214	315	529
Glenn County APCD	109	177	286
Great Basin Unified APCD	46	102	148
Imperial County APCD	46	69	115
Kern County APCD	4	11	15
Lake County AQMD	7	21	28
Lassen County APCD	48	121	169
Mariposa County APCD	0	1	1
Mendocino County AQMD	8	16	24
Modoc County APCD	35	72	107
Mojave Desert AQMD	0	2	2
Monterey Bay Unified APCD	161	513	674
North Coast Unified APCD	20	45	64
Northern Sierra AQMD	19	31	50
Northern Sonoma County APCD	7	12	20
Placer County APCD	27	34	61
Sacramento Metropolitan AQMD	35	65	101
San Diego County APCD	74	104	178
San Joaquin Valley Unified APCD	2092	4965	7057
San Luis Obispo County APCD	32	92	124
Santa Barbara County APCD	75	165	241
Shasta County AQMD	33	81	114
Siskiyou County APCD	87	161	248
South Coast AQMD	12	6	18
Tehama County APCD	60	135	195
Tuolumne County APCD	1	2	3
Ventura County APCD	44	100	145
Yolo/Solano AQMD	238	570	808
Statewide	**3879**	**8656**	**12535**

Horsepower Distribution

Where available, district data was used to define pump engine horsepower. Information on horsepower ratings of 1,032 engines from the Sacramento Non-Attainment Area and South Coast AQMD was used to allocate pump engines

for these areas. Also, Carl Moyer Program data for approximately 1,300 pump engines replaced between 1997 and 2003 was used to estimate emissions for engines in the Sacramento, San Joaquin, and Monterey Unified local air district jurisdictions.

To estimate the horsepower of pump engine populations across the state where no specific information was available, the minimum horsepower required to move water for irrigation was calculated. Where engine specific horsepower was available, comparisons were made between actual engine horsepower data and the estimated horsepower to ensure that the estimated horsepower profiles were reasonable estimates.

Three equations define the brake horsepower required to pump a given amount of water:

Equation 1:

$$TDH = SH + FH + VH + PH$$

Where:
TDH = Total Dynamic Head (feet)
SH = Total Static Head (feet) (total vertical distance pump must lift water)
FH = Friction Head (feet) (pressure head loss due to friction in pipes)
VH = Velocity Head (feet) (energy imparted to water to get it in motion; usually negligible)
PH = Pressure Head (feet) (pressure required to operate the irrigation system)
(1 foot of pressure = 2.31 pounds per square inch)

Equation 2:

$$WHP = Q * TDH / 3960$$

Where:
WHP = Water Horse Power
Q = Flow Rate in gallons per minute
TDH = Total Dynamic Head (feet; from equation 1))

Equation 3:

$$BHP = WHP / (PE * DE * LF * DRE)$$

Where:
BHP = Brake Horsepower
WHP = Water Horsepower (from equation 2)
PE = Pump Efficiency (percent)
DE = Drive Efficiency (percent)
LF = Load Factor
DRE = Relative Efficiency of Diesel Engines compared to Electric Motors

Well Pumps

The total static head for well pumps is the depth to water for a well plus the drawdown (the lowering of the water table as a result of the pumped water). The average depth to water was obtained from USGS for over 10,000 wells in California (reference 7). A drawdown of 50 feet was assumed for wells with water depths of less than 500 feet; a drawdown of 100 feet was assumed for deeper wells. The depth of pump drawdowns can vary from well to well based on location and quality of the well. In general the drawdown of a well should be negligible. However, in practice the distance can change because of seasonal rain fall or pumping at a rate that exceed the ability of the

well to refresh itself. Therefore, the maximum drawdown is the distance between the initial water level and the top of the pump bowls formed by the water pumping. To compensate for this change in static head a minimum distance between the water level and the pump bowl is assumed to range from 50 to 100 feet depending on the depth of the well.

Well locations were determined with GIS software, and only wells located within irrigated agricultural fields (as defined in the Department of Water Resources land use data set found in reference 5) were used to determine horsepower. Because the USGS well database contains information on specific wells at specific locations, these data were used to determine horsepower profiles specific to each county, air basin, and district.

Because pumps are purchased to accomplish a wide variety of tasks, a pressure head of 75 pounds per square inch (psi) was assumed as an upper bound of typical operating pressures. This pressure would be typical of that found in a booster pump that lifts the water an additional 10 feet once the water has reached the surface and pressurizes a sprinkler system such as rainmakers.

Table D-3 lists the parameters used to calculate horsepower profiles for well pump engines. Data on flow rates and the static head of booster pumps were obtained from the 2003 FRIS (reference 1). Friction head was estimated at 2.54 feet, based on data contained in publication by the National Resources Conservation Service (reference 8), which represents the friction imparted by a flow rate of 900 gallons per minute through 100 feet of steel 8-inch diameter pipe. This value was selected as a mid-range estimate of friction loss. Friction head varies with the length of irrigation pipe, flow rate, and the diameter of pipe and can range between near zero to well over 20 feet for high flow rates and lengthy pipes.

Table D-3 – Parameters Used to Calculate Horsepower of Irrigation Pump Engines

Parameter	Well Pump	Booster Pumps		
		Tailwater Pump	Pond/Lake Discharge	Relift
Static Head	Average Depth to Water	11	20	19
Friction Head (feet)	2.54	2.54	2.54	2.54
Pressure Head (psi)	75	75	75	75
Flow Rate (gpm)	802	450-4937	450-4376	450-5277
Pump Efficiency	86%	80%	80%	80%
Drive Efficiency	85%	95%	95%	95%

The pump efficiency can vary between 70 and 90 percent depending on the type, size, and number of stages. A pump efficiency of 86 percent was assumed for these calculations. The drive efficiency is the efficiency of the drive between the engine and the pump itself; it varies between 70 percent and 100 percent depending on the method used to connect the motor and the pump. For these calculations, a drive efficiency of 85 percent was used. The relative efficiency of diesel engines compared to electric motors is about 75 percent; that is, an electric motor needs to be only 75 percent as powerful as a diesel engine to perform the same amount of work.

Table D-4 lists the average estimated horsepower and the range of horsepower used to calculate emissions. This data was used only when districts did not provide specific data. The bottom-up data for the Sacramento Non-Attainment Area has an average horsepower of 147 hp for well pump engines, which compares favorably with the 149 hp/157 hp estimates for engines in the Yolo/Solano AQMD and the Sacramento Metro AQMD local air districts. The average horsepower of the engines replaced under the Carl Moyer Program for the San Joaquin Valley is 197 hp, which is very close to the 196 hp estimate in Table D-4 for the San Joaquin Unified APCD. In 1996, Sonoma Technology (reference 9) surveyed San Joaquin Valley farmers on their irrigation pumps and showed an average horsepower of 161 hp for diesel engines. However, this average was based on only 35 responses out of 368 qualified respondents.

Table D-4 – Estimated Horsepower of Diesel Well Pump Engines[1]

District	Average	Minimum	Maximum
Bay Area AQMD	148	104	248
Butte County AQMD	129	102	157
Colusa County APCD	141	116	189
Feather River AQMD	144	99	190
Glenn County APCD	132	103	162
Imperial County APCD	114	98	205
Monterey Bay Unified APCD	149	112	187
Sacramento Metropolitan AQMD	157	98	203
San Diego County APCD	130	56	305
San Joaquin Valley Unified APCD	196	76	705
San Luis Obispo County APCD	162	100	346
Santa Barbara County APCD	151	63	446
South Coast AQMD	180	100	363
Ventura County APCD	181	98	401
Yolo/Solano AQMD	149	103	211
Statewide Average	**184**	**56**	**705**

1. Statewide average assigned to areas without data

Booster Pumps

Data to calculate booster pump engine horsepower profiles is summarized in Table D-3. All parameters except for the pressure head and friction head are average values obtained from Tables 19 and 20 of the 2003 Farm and Ranch Irrigation Survey. Table D-5 summarizes the horsepower profiles of the three types of booster pump engines.

Table D-5 – Estimated Horsepower of Diesel Booster Pump Engines

Type	Percent of Type	Calculated HP
Tailwater	46%	51
Tailwater	23%	85
Tailwater	18%	141
Tailwater	3%	197
Tailwater	6%	282
Tailwater	3%	556
Tailwater	**Average**	**111**
Pond/Lake	10%	40
Pond/Lake	19%	66
Pond/Lake	9%	111
Pond/Lake	12%	155
Pond/Lake	37%	221
Pond/Lake	12%	387
Pond/Lake	**Average**	**176**
Relift	21%	53
Relift	19%	88
Relift	17%	147
Relift	16%	205
Relift	21%	294
Relift	4%	620
Relift	**Average**	**177**

Activity

The average annual usage of diesel irrigation pump engines is assumed to be 1,000 hours. Data on electrical use for Pacific Gas and Electric small and large agricultural electric rate payers indicates that average pumping hours may have ranged from 187 to 4,569 for year 2003 (PG&E, 2004). The 2003 Farm and Ranch Irrigation Survey indicates that the average hours of operation of well pump engines was 1,016 hours. Finally, analysis of irrigation pump engines replaced under the Carl Moyer Program shows that the average pump usage is about 1,000 hours.

Age Distribution

The average useful life of an irrigation pump engine is about 20 years; that is, half of the engines that were purchased 20 years ago will still be in operation. Engines

replaced under the Carl Moyer Program were as old as 61 years but averaged 18 years of age. The American Society of Agricultural Engineers has estimated the average agricultural engine is used 20,000 hours (ASAE, 2005). At an average annual usage of 1,000 hours, 20 years is a reasonable estimate of useful life. The actual age of irrigation pump engines was available for 1,032 engines in the Sacramento Non-Attainment area and the 1,300 pump engines replaced through the Carl Moyer Program from 1997 through 2003. For all other pump engines, an age distribution was calculated using the methodology used in the ARB OFFROAD model. Table D-6 shows the base year age distribution. The OFFROAD age distribution methodology takes into account an "S"-shaped scrappage curve and historic diesel engine populations reported in the Farm and Ranch Irrigation Surveys for the years 1984, 1988, 1994, 1998, and 2003. For all other years within the complete 40 year time span, the average yearly growth between the years 1984 and 2003 was assumed. (Note: for future years, different growth rates are assumed and will be discussed in the "Growth" section).

Table D-6 – Base Year Age Distribution of Diesel Irrigation Pump Engines

Age	Model Year	Percent
0	2003	8.3%
1	2002	7.7%
2	2001	7.5%
3	2000	7.2%
4	1999	3.1%
5	1998	3.0%
6	1997	2.8%
7	1996	2.6%
8	1995	4.4%
9	1994	4.3%
10	1993	4.1%
11	1992	3.9%
12	1991	3.7%
13	1990	3.5%
14	1989	4.5%
15	1988	4.3%
16	1987	4.0%
17	1986	3.7%
18	1985	2.5%
19	1984	2.9%
20	1983	2.4%
21	1982	1.5%
22	1981	1.3%
23	1980	1.1%
24	1979	1.0%
25	1978	0.8%
26	1977	0.7%
27	1976	0.6%
28	1975	0.5%
29	1974	0.4%
30	1973	0.4%
31	1972	0.3%
32	1971	0.2%
33	1970	0.2%
34	1969	0.2%
35	1968	0.1%
36	1967	0.1%
37	1966	0.1%
38	1965	0.1%
39	1964	0.1%
40	1963	0.0%

Load Factor
The load factor assumed for agricultural irrigation pump engines was 65 percent. This figure was based on extensive discussions with engine dealers, manufacturers, and irrigation experts.

Emission Factors
Emission factors for CO, hydrocarbons, NOx, PM, and CO_2 were used to estimate emissions. These emission factors are from the OFFROAD model and are based upon source tests of engines. The OFFROAD emission factors are in three parts: the zero hour emission factor; the base emission rate for a new engine; and a deterioration factor, which is dependant on the cumulative number of hours an engine has been in operation. The final emission factor is the zero hour emission factor plus the deterioration factor times the cumulative engine use (in hours). Because engines can only deteriorate a certain amount before they cease to operate, deterioration was capped at the average useful life of the engine, or 20 years (20,000 hours). These emission factors are summarized in Table D-7.

OFFROAD diesel emission factors require adjustment for calculation of TOG: hydrocarbon emissions must be multiplied by a factor of 1.44 to get TOG. OFFROAD emission factors for NOx and PM also need to be corrected for the difference between the fuels the factors were developed with and the fuels actually used in California. These fuel correction factors are specific for the year of emission estimates, the model year of the equipment, and the horsepower of the equipment. For NOx, the fuel correction factor varies between 0.93 and 1; for PM, the fuel correction factor varies between 0.72 and 1.0. For ROG, the fuel correction factor is 0.72 for diesel fuel.

Table D-7 – Diesel Emission Factors

		Hydrocarbons		Carbon Monoxide		NOx		PM		CO2	
Horsepower	Year	Base	Deterioration	Base	Deterioration	Base	Deterioration	Base	Deterioration	Base	Deterioration
15	1994	1.5	0.00E+00	5	0.00E+00	10	0.00E+00	1	0.00E+00	568.3	0.00E+00
15	1998	1.31	0.00E+00	1.9	0.00E+00	3.46	0.00E+00	0.351	0.00E+00	568.3	0.00E+00
15	2020	0.42	0.00E+00	0.6	0.00E+00	1.11	0.00E+00	0.097	0.00E+00	568.3	0.00E+00
25	1994	1.84	0.00E+00	5	0.00E+00	6.92	0.00E+00	0.764	0.00E+00	568.3	0.00E+00
25	1998	1.63	0.00E+00	1.4	0.00E+00	3.89	0.00E+00	0.417	0.00E+00	568.3	0.00E+00
25	2020	0.52	0.00E+00	0.5	0.00E+00	1.24	0.00E+00	0.116	0.00E+00	568.3	0.00E+00
50	1987	1.84	2.35E-04	5	5.13E-04	7	1.05E-04	0.76	5.89E-05	568.3	0.00E+00
50	1998	1.8	2.30E-04	5	5.13E-04	6.9	1.04E-04	0.76	5.89E-05	568.3	0.00E+00
50	2003	1.45	1.85E-04	4.1	4.20E-04	5.55	1.03E-04	0.6	4.65E-05	568.3	0.00E+00
50	2004	0.64	9.80E-05	3.27	3.34E-04	5.1	9.33E-05	0.43	3.36E-05	568.3	0.00E+00
50	2005	0.37	6.90E-05	3	3.05E-04	4.95	9.67E-05	0.38	2.93E-05	568.3	0.00E+00
50	2007	0.24	5.45E-05	2.86	2.90E-04	4.88	9.83E-05	0.35	2.72E-05	568.3	0.00E+00
50	2020	0.1	4.00E-05	2.72	2.76E-04	4.8	1.00E-04	0.32	2.50E-05	568.3	0.00E+00
120	1987	1.44	6.66E-05	4.8	1.27E-04	13	3.01E-04	0.84	6.11E-05	568.3	0.00E+00
120	1997	0.99	4.58E-05	3.49	9.23E-05	8.75	2.02E-04	0.69	5.02E-05	568.3	0.00E+00
120	2003	0.99	4.58E-05	3.49	9.23E-05	6.9	1.60E-04	0.69	5.02E-05	568.3	0.00E+00
120	2004	0.46	3.33E-05	3.23	8.55E-05	5.64	1.03E-04	0.39	2.85E-05	568.3	0.00E+00
120	2005	0.28	2.92E-05	3.14	8.33E-05	5.22	8.40E-05	0.29	2.12E-05	568.3	0.00E+00
120	2007	0.19	2.71E-05	3.09	8.21E-05	5.01	7.45E-05	0.24	1.76E-05	568.3	0.00E+00
120	2020	0.1	2.50E-05	3.05	8.10E-05	2.89	3.80E-05	0.19	1.40E-05	568.3	0.00E+00
175	1969	1.32	6.11E-05	4.4	1.16E-04	14	3.24E-04	0.77	5.60E-05	568.3	0.00E+00
175	1971	1.1	5.09E-05	4.4	1.16E-04	13	3.01E-04	0.66	4.80E-05	568.3	0.00E+00
175	1979	1	4.63E-05	4.4	1.16E-04	12	2.78E-04	0.55	4.00E-05	568.3	0.00E+00
175	1984	0.94	4.35E-05	4.3	1.14E-04	11	2.54E-04	0.55	4.00E-05	568.3	0.00E+00
175	1987	0.88	4.07E-05	4.2	1.11E-04	11	2.54E-04	0.55	4.00E-05	568.3	0.00E+00
175	1996	0.68	3.15E-05	2.7	7.14E-05	8.17	1.89E-04	0.38	2.76E-05	568.3	0.00E+00
175	2002	0.68	3.15E-05	2.7	7.14E-05	6.9	1.60E-04	0.38	2.76E-05	568.3	0.00E+00
175	2003	0.33	2.79E-05	2.7	7.14E-05	5.26	9.64E-05	0.24	1.70E-05	568.3	0.00E+00
175	2004	0.22	2.63E-05	2.7	7.14E-05	4.72	7.52E-05	0.19	1.35E-05	568.3	0.00E+00
175	2006	0.16	2.57E-05	2.7	7.14E-05	4.44	6.46E-05	0.16	1.18E-05	568.3	0.00E+00
175	2020	0.1	2.50E-05	2.7	7.14E-05	2.45	3.20E-05	0.14	1.00E-05	568.3	0.00E+00
250	1969	1.32	6.11E-05	4.4	1.16E-04	14	3.24E-04	0.77	5.60E-05	568.3	0.00E+00
250	1971	1.1	5.09E-05	4.4	1.16E-04	13	3.01E-04	0.66	4.80E-05	568.3	0.00E+00
250	1979	1	4.63E-05	4.4	1.16E-04	12	2.78E-04	0.55	4.00E-05	568.3	0.00E+00
250	1984	0.94	4.35E-05	4.3	1.14E-04	11	2.54E-04	0.55	4.00E-05	568.3	0.00E+00
250	1987	0.88	4.07E-05	4.2	1.11E-04	11	2.54E-04	0.55	4.00E-05	568.3	0.00E+00
250	1995	0.68	3.15E-05	2.7	7.14E-05	8.17	1.89E-04	0.38	2.76E-05	568.3	0.00E+00
250	2002	0.32	1.48E-05	0.92	2.43E-05	6.25	1.45E-04	0.15	7.96E-06	568.3	0.00E+00
250	2003	0.19	2.09E-05	0.92	2.43E-05	5	9.05E-05	0.12	6.51E-06	568.3	0.00E+00
250	2004	0.14	2.30E-05	0.92	2.43E-05	4.58	7.23E-05	0.11	6.03E-06	568.3	0.00E+00
250	2006	0.12	2.40E-05	0.92	2.43E-05	4.38	6.33E-05	0.11	5.79E-06	568.3	0.00E+00
250	2020	0.1	2.50E-05	0.92	2.43E-05	2.45	3.18E-05	0.11	5.59E-06	568.3	0.00E+00

Table D-7 – Diesel Emission Factors (Continued)

Max. Horsepower	Year	Hydrocarbons		Carbon Monoxide		NOx		PM		CO2	
		Base	Deterioration	Base	Deterioration	Base	Deterioration	Base	Deterioration	Base	Deterioration
500	1969	1.26	4.39E-05	4.2	8.32E-04	14	2.33E-04	0.74	3.93E-05	568.3	0.00E+00
500	1971	1.05	3.66E-05	4.2	8.32E-04	13	2.16E-04	0.63	3.34E-05	568.3	0.00E+00
500	1979	0.95	3.31E-05	4.2	8.32E-04	12	2.00E-04	0.53	2.81E-05	568.3	0.00E+00
500	1984	0.9	3.14E-05	4.2	8.32E-04	11	1.83E-04	0.53	2.81E-05	568.3	0.00E+00
500	1987	0.84	2.93E-05	4.1	8.12E-04	11	1.83E-04	0.53	2.81E-05	568.3	0.00E+00
500	1995	0.68	2.37E-05	2.7	5.35E-05	8.17	1.36E-04	0.38	2.02E-05	568.3	0.00E+00
500	2000	0.32	1.12E-05	0.92	1.82E-05	6.25	1.04E-04	0.15	7.96E-06	568.3	0.00E+00
500	2001	0.19	1.95E-05	0.92	1.82E-05	4.95	7.34E-05	0.12	6.51E-06	568.3	0.00E+00
500	2002	0.14	2.22E-05	0.92	1.82E-05	4.51	6.32E-05	0.11	6.03E-06	568.3	0.00E+00
500	2004	0.12	2.36E-05	0.92	1.82E-05	4.29	5.81E-05	0.11	5.79E-06	568.3	0.00E+00
500	2005	0.1	2.50E-05	0.92	1.82E-05	4	5.30E-05	0.11	5.55E-06	568.3	0.00E+00
500	2020	0.1	2.50E-05	0.92	1.82E-05	2.45	3.18E-05	0.11	5.55E-06	568.3	0.00E+00
750	1969	1.26	4.39E-05	4.2	8.32E-04	14	2.33E-04	0.74	3.93E-05	568.3	0.00E+00
750	1971	1.05	3.66E-05	4.2	8.32E-04	13	2.16E-04	0.63	3.34E-05	568.3	0.00E+00
750	1979	0.95	3.31E-05	4.2	8.32E-04	12	2.00E-04	0.53	2.81E-05	568.3	0.00E+00
750	1984	0.9	3.14E-05	4.2	8.32E-04	11	1.83E-04	0.53	2.81E-05	568.3	0.00E+00
750	1987	0.84	2.93E-05	4.1	8.12E-04	11	1.83E-04	0.53	2.81E-05	568.3	0.00E+00
750	1995	0.68	2.37E-05	2.7	5.35E-05	8.17	1.36E-04	0.38	2.02E-05	568.3	0.00E+00
750	2001	0.32	1.12E-05	0.92	1.82E-05	6.25	1.04E-04	0.15	7.96E-06	568.3	0.00E+00
750	2002	0.19	1.95E-05	0.92	1.82E-05	4.95	7.34E-05	0.12	6.51E-06	568.3	0.00E+00
750	2003	0.14	2.22E-05	0.92	1.82E-05	4.51	6.32E-05	0.11	6.03E-06	568.3	0.00E+00
750	2005	0.12	2.36E-05	0.92	1.82E-05	4.29	5.81E-05	0.11	5.79E-06	568.3	0.00E+00
750	2020	0.1	2.50E-05	0.92	1.82E-05	2.45	3.18E-05	0.11	5.55E-06	568.3	0.00E+00
>750	1969	1.26	4.39E-05	4.2	8.32E-04	14	2.33E-04	0.74	3.93E-05	568.3	0.00E+00
>750	1971	1.05	3.66E-05	4.2	8.32E-04	13	2.16E-04	0.63	3.34E-05	568.3	0.00E+00
>750	1979	0.95	3.31E-05	4.2	8.32E-04	12	2.00E-04	0.53	2.81E-05	568.3	0.00E+00
>750	1984	0.9	3.14E-05	4.2	8.32E-04	11	1.83E-04	0.53	2.81E-05	568.3	0.00E+00
>750	1987	0.84	2.93E-05	4.1	8.12E-04	11	1.83E-04	0.53	2.81E-05	568.3	0.00E+00
>750	1999	0.68	1.12E-05	2.7	5.35E-05	8.17	1.36E-04	0.38	2.02E-06	568.3	0.00E+00
>750	2005	0.32	1.12E-05	0.92	1.82E-05	6.25	1.04E-04	0.15	7.96E-06	568.3	0.00E+00
>750	2006	0.19	1.95E-05	0.92	1.82E-05	4.95	7.34E-05	0.12	6.51E-06	568.3	0.00E+00
>750	2007	0.14	2.22E-05	0.92	1.82E-05	4.51	6.32E-05	0.11	6.03E-06	568.3	0.00E+00
>750	2009	0.12	2.36E-05	0.92	1.82E-05	4.29	5.81E-05	0.11	5.79E-06	568.3	0.00E+00
>750	2020	0.1	2.50E-05	0.92	1.82E-05	4.08	5.30E-05	0.11	5.55E-06	568.3	0.00E+00

Units for all pollutants are grams/horsepower-hour.

Growth

In April, 2005, the ARB agricultural advisory committee approved a set of growth factors for various types of agricultural equipment. For most categories, including irrigation pump engines, the growth factor selected was irrigated acreage, as collected by the California Department of Conservation's Farmland Monitoring and Mapping Program for the years 1996-2002 (reference 12). These growth factors are defined by county for the San Joaquin Valley; an average is used for the rest of the State. Table D-8 presents these growth factors. With the exception of Madera and Merced counties, the growth of irrigated acreage is declining.

Since usage of diesel agricultural irrigation pump engines is not only defined by the amount of agricultural acreage, but also by market forces including energy costs, the growth rate of these engines will be revisited in future years as the USDA publishes new Farm and Ranch Irrigation Surveys. These surveys are performed approximately every five years.

Table D-8 – Growth Rates by County

County Name	Growth Factor (per year)
Fresno	-0.73%
Kern	-0.33%
Kings	-0.14%
Madera	0.20%
Merced	0.03%
San Joaquin	-0.32%
Stanislaus	-0.12%
Tulare	-0.62%
All Other Counties	**-0.26%**

To calculate emissions growth for future years, the base year population was grown using the growth factors described above using the methodology used for the ARB OFFROAD model. Because the number of diesel irrigation engines increased dramatically between 1998 and 2003, the base year age distribution contains a large percentage of late model engines that declines in future years as these engines are retired.

RESULTS

Table D-9 shows the statewide emissions for the base year (2003) by local air district for all diesel pump engines. More than half of the emissions of diesel irrigation pump engines are in the San Joaquin Valley Unified APCD, due to both the large number of pump engines in that district and because wells on the west side of the district tend to be very deep and therefore require much larger engines. Table D-10 shows the statewide emissions by horsepower and by pump engine portability. About two-thirds of the statewide emissions are from stationary pump engines based on the Booz-Hamilton assumption presented in table D-1. Table D-11 shows the forecasted statewide emissions (does not include the benefits of the regulation). Emissions decline over time because of the negative growth rate which reflects the disappearance of agricultural land in California and because as time goes on, existing federal off-road compression ignition engine certification standards result in the replacement of older, dirtier engines with newer, cleaner engines. By 2025, emissions of all pollutants (except CO_2) are less than half those seen in 2003.

Table D-9 – 2003 Diesel Agricultural Irrigation Pump Engine Emissions By Local Air District (tons per day)

District	CO	CO2	DPM	HC	NOx	PM	PM10	PM25	ROG	TOG
Amador County APCD	0.0	3.4	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Antelope Valley APCD	0.1	7.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Bay Area AQMD	0.3	28.4	0.0	0.1	0.5	0.0	0.0	0.0	0.1	0.1
Butte County AQMD	0.9	85.4	0.1	0.2	1.6	0.1	0.1	0.1	0.2	0.3
Calaveras County AQMD	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Colusa County APCD	0.5	57.6	0.1	0.1	1.1	0.1	0.1	0.1	0.1	0.2
El Dorado County APCD	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Feather River AQMD	0.8	86.5	0.1	0.2	1.7	0.1	0.1	0.1	0.2	0.3
Glenn County APCD	0.5	48.7	0.0	0.1	0.9	0.1	0.0	0.0	0.1	0.2
Great Basin Unified APCD	0.3	29.6	0.0	0.1	0.5	0.0	0.0	0.0	0.1	0.1
Imperial County APCD	0.2	20.4	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1
Kern County APCD	0.0	3.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Lake County AQMD	0.1	5.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Lassen County APCD	0.3	34.1	0.0	0.1	0.6	0.0	0.0	0.0	0.1	0.1
Mariposa County APCD	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mendocino County AQMD	0.0	4.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Modoc County APCD	0.2	21.3	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1
Mojave Desert AQMD	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Monterey Bay Unified APCD	1.0	122.0	0.1	0.2	2.2	0.1	0.1	0.1	0.3	0.3
North Coast Unified APCD	0.1	13.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Northern Sierra AQMD	0.1	9.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Northern Sonoma County APCD	0.0	3.8	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Placer County APCD	0.1	9.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Sacramento Metropolitan AQMD	0.1	16.9	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.1
San Diego County APCD	0.4	32.9	0.0	0.1	0.6	0.0	0.0	0.0	0.1	0.1
San Joaquin Valley Unified APCD	14.5	1451.2	1.3	2.8	26.3	1.5	1.3	1.2	3.4	4.0
San Luis Obispo County APCD	0.2	23.4	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1
Santa Barbara County APCD	0.4	42.9	0.0	0.1	0.8	0.0	0.0	0.0	0.1	0.1
Shasta County AQMD	0.2	23.3	0.0	0.0	0.4	0.0	0.0	0.0	0.1	0.1
Siskiyou County APCD	0.5	48.5	0.0	0.1	0.9	0.1	0.0	0.0	0.1	0.1
South Coast AQMD	0.0	3.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Tehama County APCD	0.4	39.2	0.0	0.1	0.7	0.0	0.0	0.0	0.1	0.1
Tuolumne County APCD	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ventura County APCD	0.3	29.1	0.0	0.1	0.5	0.0	0.0	0.0	0.1	0.1
Yolo/Solano AQMD	1.1	143.2	0.1	0.3	2.7	0.2	0.1	0.1	0.3	0.4
Statewide	**23.8**	**2452.1**	**2.2**	**4.8**	**44.9**	**2.6**	**2.2**	**2.2**	**5.8**	**6.9**

Table D-10 – 2003 Diesel Agricultural Irrigation Pump Engine Emissions By Horsepower and Portability (tons per day)

Portability	Horsepower	CO	CO2	DPM	HC	NOx	PM	PM10	PM25	ROG	TOG
Portable	26 to 50	0.1	6.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
Portable	51 to 120	2.1	231.8	0.3	0.7	4.9	0.4	0.3	0.3	0.6	1.0
Portable	121 to 175	1.2	165.3	0.1	0.3	3.0	0.2	0.1	0.1	0.3	0.5
Portable	176 to 250	0.7	98.8	0.1	0.2	1.8	0.1	0.1	0.1	0.2	0.3
Portable	251 to 500	0.9	55.8	0.0	0.1	0.9	0.0	0.0	0.0	0.1	0.1
Portable	501 to 750	0.1	7.9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Portable Total		**5.1**	**565.8**	**0.6**	**1.3**	**10.9**	**0.7**	**0.6**	**0.6**	1.2	**1.9**
Stationary	26 to 50	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Stationary	51 to 120	0.9	98.5	0.1	0.3	2.1	0.2	0.1	0.1	0.3	0.4
Stationary	121 to 175	4.9	649.9	0.6	1.3	12.1	0.7	0.6	0.6	1.1	1.8
Stationary	176 to 250	3.8	560.7	0.5	1.0	10.2	0.5	0.5	0.5	0.9	1.5
Stationary	251 to 500	7.9	505.3	0.3	0.8	8.4	0.4	0.3	0.3	0.7	1.1
Stationary	501 to 750	1.2	71.2	0.1	0.1	1.3	0.1	0.1	0.1	0.1	0.2
Stationary Total		**18.7**	**1886.3**	**1.6**	**3.5**	**34.0**	**1.9**	**1.6**	**1.6**	3.0	**5.0**
Statewide Total		**23.8**	**2452.1**	**2.2**	**4.8**	**44.9**	**2.6**	**2.2**	**2.2**	4.2	**6.9**

Table D-11 – Forecasted Diesel Agricultural Irrigation Pump Engine Emissions (tons per day)

Pollutant	2003	2005	2010	2015	2020	2025
CO	23.8	22.8	19.5	15.7	12.9	10.9
CO2	2452.1	2439.4	2407.5	2375.6	2343.7	2311.9
DPM	2.2	2.2	1.9	1.6	1.3	1.0
HC	4.8	4.6	4.0	3.4	2.8	2.2
NOx	44.9	43.3	38.4	33.1	27.9	21.6
PM	2.6	2.5	2.2	1.9	1.6	1.2
PM10	2.2	2.2	1.9	1.6	1.3	1.0
PM25	2.2	2.1	1.9	1.6	1.3	1.0
ROG	4.2	4.0	3.5	3.0	2.4	1.9
TOG	6.9	6.7	5.8	4.9	4.0	3.1

REFERENCES FOR APPENDIX D

1. US Department of Agriculture National Agricultural Statistics Service, 2003 Farm and Ranch Irrigation Survey (On the internet at http://www.nass.usda.gov/census/census02/fris/fris03.htm) and California Well Pump Data by County (Special Request by the Air Resources Board), June 2005.
2. Personal communication from Hao Quinn, Sacramento Metropolitan Air Quality Management District
3. Personal communication from Al Baez, South Coast Air Quality Management District
4. US Geological Survey, Estimated Use of Water in the United States County-Level Data for 2000. On the internet at http://water.usgs.gov/watuse/data/2000/index.html
5. California Department of Water Resources, California Land and Water Use Datasets. On the internet at: http://www.landwateruse.water.ca.gov/basicdata/landuse/landusesurvey.cfm
6. Booz-Allen & Hamilton, Off-Road Mobile Equipment Emission Inventory Estimate, January 1992.
7. US Geological Survey, California Ground Water Levels. On the internet at: http://nwis.waterdata.usgs.gov/ca/nwis/gwlevels.
8. National Resources Conservation Service, National Engineering Handbook Part 652 – Irrigation guide, Chapter 12. On the internet at http://www.wcc.nrcs.usda.gov/nrcsirrig/irrig-handbooks-part652.html
9. Sonoma Technology Incorporated, Emission Inventory of Agricultural Internal Combustion Engines used for Irrigation in the SJVUAPCD, Final Report, STI-95240-1569, August 1996.
10. PG&E, 2004. Personal Communication (email attachment), Keith Coyne, Pacific Gas and Electric, to Carol McLaughlin, ARB Stationary Source Division, 2004.
11. ASAE, 2005. Personal Communication (email) from Carla Miller, American Society of Agricultural Engineers, to Barbara Cook, ARB Stationary Source Division, February 9, 2005.
12. California Department of Conservation, Farmland Monitoring and Mapping Program, California Farmland Conversion Report, on the internet at: http://www.consrv.ca.gov/dlrp/fmmp/index.htm.

Appendix E

Health Risk Assessment Methodology

Appendix E

Health Risk Assessment Methodology

A. Introduction

This appendix presents the methodology used to estimate the potential cancer risk from exposure to diesel particulate matter (PM) emitted from diesel-fuel stationary agricultural pump engines. The methodology was developed to assist in development of the proposed amendments to the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM).

The estimated potential cancer risks and assumptions used to determine these risks are not based on a specific engine location or operating parameters. Instead, general assumptions representing a fairly broad range of possible operating scenarios were used. Additionally, exposures were estimated at specific downwind distances, including the point of maximum impact (PMI), as determined using air dispersion modeling. The estimated potential risk ranges are used to provide a "qualitative" assessment of the potential risk levels near operation of diesel-fueled agricultural pump engines. Actual risk levels vary due to site-specific parameters, including horsepower rating, configuration of the engine, emission rates, operating schedules, site configuration, site meteorology, and distance to receptors.

B. Air Dispersion Modeling

The methodology used in this risk assessment is consistent with the Tier-1 analysis presented in the Office of Environmental Health Hazard Assessment (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). The 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 2005); and the Air Toxics Hot Spot Program Risk Assessment Guidelines, Part IV, Technical Support Document for Exposure Analysis and Stochastic Analysis (OEHHA 2000), respectively. In conjunction with the OEHHA guidelines, staff also followed the ARB Interim Risk Management Policy (ARB, 2003d).

1. Model Used

The PM emissions are modeled in this scenario using the United States Environmental Protection Agency Industrial Source Complex Short Term Model – Version 3 (ISCST3 Date: 00101). ISCST3 is an air dispersion model that allows an estimation of the annual average above ambient diesel PM concentrations.

2. Meteorological Data

Meteorological data are site-specific parameters that are used in air dispersion modeling to calculate concentrations of emissions and subsequent risk. For this scenario, Fresno meteorological data (1985 – 1989) were selected for the dispersion modeling. Fresno data is representative of the meteorological conditions under which the majority of agricultural pump engines operate.

3. Dispersion Model Parameters and Emission Factors

For this modeling exercise ARB staff used a matrix of parameters. Staff modeled pump engines within three size categories: less than or equal to (≤) 120 brake horsepower (bhp), greater than (>) 120 bhp and ≤ 175 bhp, and > 175 bhp. For each size category, we estimated the potential health impacts at five certification standards of diesel PM emission factors: uncertified (or Tier 0), Tier 1, Tier 2, Tier 3, and Tier 4. The emission factors for each standard in the three size categories are presented in Table Sets 1, 2, and 3 in Section C of this appendix. Table Sets 1, 2, and 3 also show the cancer health risks at varying annual hours of operation between 100 and 3,000 hours per year at specific downwind distances.

For all the size categories, the dispersion modeling uses the rural dispersion coefficient because most agricultural pump engines are located in farming areas with lower rural populations. Stack parameters used for all size categories are a stack height of 84 inches and a stack diameter of four inches. The emission factors for each tiered standard are certification levels where applicable, or the emission inventory when certification values were not available. The modeling parameters are summarized in Table E-1.

Table E-1. Dispersion Modeling Parameters

Modeling Parameter	Engine Size Category		
	≤ 120 bhp	> 120 and ≤ 175 bhp	> 175 bhp
Engine Horsepower (at operational load)	86 bhp	130 bhp	225 bhp
Stack Temperature	744° K	719° K	622° K
Stack Exhaust Velocity	36.7 m/s	53.0 m/s	70.9 m/s

4. Health Risk Assessment Parameters

For the assessment of health risks, the annual average ambient concentration of diesel PM is used to estimate inhalation dose (mg/kg-day). The inhalation dose is also based on daily breathing rates and averaging time periods. The inhalation cancer potency factor is applied to the inhalation dose to estimate potential cancer health risks expressed as chances per million. The diesel particulate inhalation cancer potency factor is 1.1 $(mg/kg\text{-}day)^{-1}$. For this assessment, the OEHHA mean breathing rate of 302 liters/per kg body weight per day (L/kg-day) is used, as recommended in the ARB

interim risk management policy (ARB, 2003). This breathing rate corresponds to the 80th percentile breathing rate.

C. Risk Assessment Results

The risk assessment results are summarized in three sets of tables (starting on Page E-4), one set for each modeled horsepower (86 bhp, 130 bhp, and 225 bhp). The tables show potential cancer health risks as a function of annual hours of operation and distance from the source of the emissions. The tables also show risks at each emission rate standard beginning with Tier 0 (or uncertified) to Tier 4 standards.

Table Set 1. Potential Cancer Health Risk (per million) for 86 bhp Engine

Tier 4 - 0.01 g/bhp-hr

Annual Hours of Operation	Distance from source (m) 20	40	60	80	100	200	500	1000	1500
100 hours of operation	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
300 hours of operation	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
500 hours of operation	< 1	1	1	< 1	< 1	< 1	< 1	< 1	< 1
1000 hours of operation	1	2	1	1	1	< 1	< 1	< 1	< 1
2000 hours of operation	2	3	2	2	1	1	< 1	< 1	< 1
2400 hours of operation	2	4	3	2	2	1	< 1	< 1	< 1
3000 hours of operation	3	5	4	3	2	1	< 1	< 1	< 1

Uncertified - 0.84 g/bhp-hr

Annual Hours of Operation	Distance from source (m) 20	40	60	80	100	200	500	1000	1500
100 hours of operation	7	13	10	8	6	2	1	< 1	< 1
300 hours of operation	22	38	30	23	17	7	2	1	1
500 hours of operation	37	64	51	38	29	11	4	2	1
1000 hours of operation	73	128	101	76	58	22	8	3	2
2000 hours of operation	147	256	202	152	115	45	15	6	4
2400 hours of operation	176	308	243	182	138	53	18	8	5
3000 hours of operation	220	385	303	227	173	67	23	10	6

Tier 1 - 0.69 g/bhp-hr

Annual Hours of Operation	Distance from source (m) 20	40	60	80	100	200	500	1000	1500
100 hours of operation	6	11	8	6	5	2	1	< 1	< 1
300 hours of operation	18	32	25	19	14	5	2	1	< 1
500 hours of operation	30	53	42	31	24	9	3	1	1
1000 hours of operation	60	105	83	62	47	18	6	3	2
2000 hours of operation	120	211	166	125	95	37	12	5	3
2400 hours of operation	144	253	199	149	114	44	15	6	4
3000 hours of operation	181	316	249	187	142	55	19	8	5

Tier 2 and Tier 3 - 0.22 g/bhp-hr

Annual Hours of Operation	Distance from source (m) 20	40	60	80	100	200	500	1000	1500
100 hours of operation	2	3	3	2	2	1	< 1	< 1	< 1
300 hours of operation	6	10	8	6	5	2	1	< 1	< 1
500 hours of operation	10	17	13	10	8	3	1	< 1	< 1
1000 hours of operation	19	34	26	20	15	6	2	1	< 1
2000 hours of operation	38	67	53	40	30	12	4	2	1
2400 hours of operation	46	81	64	48	36	14	5	2	1
3000 hours of operation	58	101	79	60	45	17	6	3	1

Risks are at mean breathing rate and 70 year exposure duration

Table Set 2. Potential Cancer Health Risk (per million) for 130 bhp Engine

Tier 4 - 0.01 g/bhp-hr

Annual Hours of Operation \ Distance from source (m)	20	40	60	80	100	200	500	1000	1500
100 hours of operation	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
300 hours of operation	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
500 hours of operation	< 1	1	1	1	< 1	< 1	< 1	< 1	< 1
1000 hours of operation	< 1	1	1	1	1	< 1	< 1	< 1	< 1
2000 hours of operation	1	3	3	2	2	1	< 1	< 1	< 1
2400 hours of operation	1	4	3	3	2	1	< 1	< 1	< 1
3000 hours of operation	1	4	4	3	3	1	< 1	< 1	< 1

Uncertified - 0.55 g/bhp-hr

Annual Hours of Operation \ Distance from source (m)	20	40	60	80	100	200	500	1000	1500
100 hours of operation	3	8	7	6	5	2	1	< 1	< 1
300 hours of operation	8	24	22	18	14	6	2	1	1
500 hours of operation	13	40	37	30	24	10	3	1	1
1000 hours of operation	27	81	75	61	48	20	7	3	2
2000 hours of operation	53	162	150	121	96	40	13	6	4
2400 hours of operation	64	194	180	145	116	48	16	7	4
3000 hours of operation	80	243	224	182	145	60	20	9	5

Tier 1 - 0.38 g/bhp-hr

Annual Hours of Operation \ Distance from source (m)	20	40	60	80	100	200	500	1000	1500
100 hours of operation	2	6	5	4	3	1	< 1	< 1	< 1
300 hours of operation	6	17	16	13	10	4	1	1	< 1
500 hours of operation	9	28	26	21	17	7	2	1	1
1000 hours of operation	18	56	52	42	33	14	5	2	1
2000 hours of operation	37	112	103	84	67	28	9	4	2
2400 hours of operation	44	134	124	100	80	33	11	5	3
3000 hours of operation	55	168	155	125	100	41	14	6	4

Tier 2 and Tier 3 - 0.22 g/bhp-hr

Annual Hours of Operation \ Distance from source (m)	20	40	60	80	100	200	500	1000	1500
100 hours of operation	1	3	3	2	2	1	< 1	< 1	< 1
300 hours of operation	3	10	9	7	6	2	1	< 1	< 1
500 hours of operation	5	16	15	12	10	4	1	1	< 1
1000 hours of operation	11	32	30	24	19	8	3	1	1
2000 hours of operation	21	65	60	48	39	16	5	2	1
2400 hours of operation	26	78	72	58	46	19	6	3	2
3000 hours of operation	32	97	90	73	58	24	8	4	2

Risks are at mean breathing rate and 70 year exposure duration

Table Set 3. Potential Cancer Health Risk (per million) for 225 bhp Engine

Tier 4 - 0.01 g/bhp-hr

Annual Hours of Operation	Distance from source (m) 20	40	60	80	100	200	500	1000	1500
100 hours of operation	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
300 hours of operation	< 1	< 1	1	< 1	< 1	< 1	< 1	< 1	< 1
500 hours of operation	< 1	1	1	1	1	< 1	< 1	< 1	< 1
1000 hours of operation	< 1	1	2	1	1	1	< 1	< 1	< 1
2000 hours of operation	1	3	3	3	2	1	< 1	< 1	< 1
2400 hours of operation	1	3	4	4	3	1	< 1	< 1	< 1
3000 hours of operation	1	4	5	4	4	2	1	< 1	< 1

Uncertified - 0.55 g/bhp-hr

Annual Hours of Operation	Distance from source (m) 20	40	60	80	100	200	500	1000	1500
100 hours of operation	2	8	9	8	7	3	1	< 1	< 1
300 hours of operation	5	24	28	24	20	9	3	1	1
500 hours of operation	8	39	46	40	34	15	5	2	1
1000 hours of operation	16	78	92	81	68	31	10	5	3
2000 hours of operation	32	157	183	162	136	62	21	10	6
2400 hours of operation	39	188	220	194	163	74	25	12	7
3000 hours of operation	49	235	275	243	204	93	31	14	9

Tier 1 - 0.40 g/bhp-hr

Annual Hours of Operation	Distance from source (m) 20	40	60	80	100	200	500	1000	1500
100 hours of operation	1	6	7	6	5	2	1	< 1	< 1
300 hours of operation	4	17	20	18	15	7	2	1	< 1
500 hours of operation	6	29	33	29	25	11	4	2	< 1
1000 hours of operation	12	57	67	59	49	22	8	3	< 1
2000 hours of operation	24	114	133	118	99	45	15	7	< 1
2400 hours of operation	28	137	160	141	119	54	18	8	< 1
3000 hours of operation	35	171	200	176	148	67	23	10	< 1

Tier 2 and Tier 3 - 0.15 g/bhp-hr

Annual Hours of Operation	Distance from source (m) 20	40	60	80	100	200	500	1000	1500
100 hours of operation	< 1	2	3	2	2	1	< 1	< 1	< 1
300 hours of operation	1	6	8	7	6	3	1	< 1	< 1
500 hours of operation	2	11	13	11	9	4	1	1	< 1
1000 hours of operation	4	21	25	22	19	8	3	1	1
2000 hours of operation	9	43	50	44	37	17	6	3	2
2400 hours of operation	11	51	60	53	45	20	7	3	2
3000 hours of operation	13	64	75	66	56	25	9	4	2

Risks are at mean breathing rate and 70 year exposure duration

1. Estimated Cancer Health Risk As A Function Of Emission Factor

For the range of engine sizes modeled, engines emitting 0.01 g/bhp-hr (Tier 4) or less could run up to 1,000 hours per year without exceeding the lowest range of estimated risks (10 or less chances per million). For the engines with emission rates of 0.15 g/bhp-hr and 0.22 g/bhp-hr (Tier 2 and Tier 3), hours of operation and downwind

distance did not exceed the lowest range of risks, with the higher risk ranges occurring at greater than 300 annual operating hours and low to moderate downwind distances. For engines with emissions rates of 0.4 g/bhp-hr and higher (Tier 1 and uncertified), the assessment found higher risks at low to moderate downwind distances and longer annual operating hours, with the proportion of moderate to high risk level results increasing as emission factors increase.

2. Estimated Cancer Health Risk as a Function of Hours of Operation

Generally, as the hours of operation increased, the number of engines that exceeded the lowest risk range increased. However, most engines could operate for 10 to 20 hours per year without exceeding the lowest range of risk.

3. Estimated Cancer Health Risk as a Function of Horsepower

For the engine configurations evaluated in these scenarios, the smaller horsepower engines (86 and 130 bhp), typically demonstrated higher near source risk for a given number of hours of operation than the larger engine (at 40 meters). The larger engine (225 bhp) had the point of maximum impact further from the engine (60 meters) due to the greater plume dispersion that occurs with the larger horsepower engines.

REFERENCES FOR APPENDIX E

ARB, 2003d. Air Resources Board Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk. October 9, 2003.

OEHHA, 2000. Office of Environmental Health Hazard Assessment. Air Toxics Hot Spots Program Risk Assessment Guidelines, Part IV, Technical Support Document for Exposure Analysis and Stochastic Analysis; 2000.

OEHHA, 2003. Office of Environmental Health Hazard Assessment. Air Toxics Hot Spots Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments; 2003.

OEHHA, 2005. Office of Environmental Health Hazard Assessment. Air Toxics Hot Spots Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors; 2005.

Appendix F

Economic Analysis Methodology

Appendix F

Economic Analysis Methodology

A. Determination of Number of Affected Diesel Engines Per Business

Until recently, the affected engines were not tracked as to their quantities, sizes, and operating locations. The 2003 Farm and Ranch Irrigation Survey (FRIS) mentioned elsewhere in this staff report provides the best known data available on the affected engines and the businesses that own and operate them. However, the FRIS does not have direct data regarding the numbers of diesel engines per business and their size, as measured by gross sales revenue. For cost discussion and analysis purposes, an average number of affected engines per business was determined. Simplifying assumptions were used and are stated in the following discussion, which determined that one to three affected engines per business is an appropriate range.

It should be noted that many factors influence the number of affected diesel engines per business; although a range average was determined, some businesses may have none, thus resulting in no cost impact to those businesses, while others may have an above-average number of affected engines and may thus incur higher-than-average compliance costs. Some of the main factors that influence the number of affected engines per business include:

- Types of crop(s) raised (will dictate water needs; may also vary from year-to-year due to crop rotation, anticipated crop prices, etc.);
- Irrigation water availability, sources, and cost;
- Type of irrigation water distribution system used (gravity feed, pressure-fed); and
- Cost/proximity to available pump power sources (non-diesel power sources with favorable conditions may mean fewer or no diesel engines).

FRIS Table 14 shows that most (64 percent) farms have one well; for analysis purposes, this was considered the low end of the range, as an affected business would have at least one affected diesel engine. It was considered more meaningful to use a range for the number of affected engines per business, as this would cover a wide range of affected businesses. For readers with a specific number of affected engines and their size(s) in mind, costs can be estimated by using Table VI-1 in Chapter VI.

From FRIS Table 20, the number of diesel-powered pumps reported in California is 12,535, operated by 3,895 farms and/or ranches. It should be noted that this number includes those smaller than 50 horsepower (hp), which are not affected by the proposed amendments. Dividing the number of farms by the number of engines reported yields an average of 3.22 or 3 engines per business, rounded. Note that this is not the number of irrigation wells or pumps per business, which is much larger (only 15 percent of all pumps are reported to be diesel engine powered); the predominant (at 83 percent) power source is electricity (USDA, 2002b).

B. Estimation of Local Air District Fee Range

Since only two of the 35 local air districts have established or are in the process of establishing permit or registration programs for the affected engines, use of an accurate range of district fees for cost estimation purposes was not possible. For cost estimation purposes, a range of fees was established using actual district fees for the low end and a variation of ARB's Portable Equipment Registration Program (PERP) for the high end. The variation to the PERP fee schedule involves converting their triennial and quinquennial fees to annual fees; inspections are assumed to occur triennially.

Because the fee range is used to estimate the costs to affected businesses and not the amount of anticipated revenue for the districts, an allowance is added to the initial registration fee only (for both low- and high-end scenarios) for the cost to an affected business of preparing and submitting the initial registration application. An allowance of two hours at $50.00/hour (for a total of $100) has been estimated for the initial registration for each affected engine. Since most registration renewals will primarily involve payment of fees and no submittal of the detailed information required for an initial registration, no cost allowance for a business renewing a registration has been made.

Where local air districts already have sufficient information on an affected engine (engines replaced with Moyer incentive funding assistance or otherwise subject to district permitting), discounted fee schedules may be used in some cases. The degree to which affected engines may qualify for discounted fees is unknown and for the purposes of this analysis it is assumed that none of the affected engines qualify for discounted fees.

In addition, affected engines qualifying for the remote location exemption would not have to meet the proposed stricter emission standards, but would still be required to register with the local air districts and pay fees. The number of eligible engines is undetermined at this time; therefore, this economic analysis does consider the impacts of registration fees paid for these engines.

C. Loss-of-Use Calculation

For the purposes of calculating an in-use engine's loss-of-use costs due to the proposed amendments, the affected engines are separated into size (horsepower) categories and subcategories by emission standard (Tier 0 through Tier 2) and model year. The left-hand columns of Table F-2 list all size categories and subcategories of affected engines. A subcategory may contain one or more model year engines; for analysis purposes, the latest model year in a subcategory is considered the model year for the subcategory. For example, a subcategory containing 2001, 2002, and 2003 model year engines would be considered all model year 2003 engines for analysis purposes.

With the model year of a subcategory, an assumed 20-year engine life, and the proposed amendment compliance date, the loss-of-use amount for the subcategory may be calculated by Equation 1.

(1) *Loss of use (engine) = New Engine Cost x (20 - (compliance year - engine model year))/20*

The engines are typically rebuilt ten years after being placed in service; the rebuild cost is also counted in the loss of use cost for the engines. This is a conservative estimate, as in situations where the engine owner/operator knows that the in-use engine must meet the proposed standards shortly after the anticipated rebuild date, many owner/operators will not rebuild the engine. The rebuild cost will vary significantly, depending upon the exact condition of the in-use engine at the time of rebuild. For the purposes of this analysis, the rebuild cost is assumed to be 50 percent of the new engine cost. Using the Equation 2, the loss-of-use cost for an engine rebuild can be calculated.

(2) *Loss-of-use (rebuild) = Rebuild Cost x (10 - (compliance year - rebuild year))/10*

The loss-of-use costs (engine & rebuild) are then multiplied by the appropriate amortization factors to apportion the cost over the appropriate time period. These amortized (annual) costs are then multiplied by the number of engines of the affected model year(s) (MY) at the start of the amortization period to give a total amortized cost for the subcategory. The start of the amortization period is the year after the compliance deadline for the subcategory; since all deadlines fall on December 31st of a given year, the next year is the day after, or January 1st.

D. Total Cost Calculation

Per engine subcategory, the component costs of the total cost are as follows:

Table F-1. Component Costs Per Engine Subcategory

Effective Year	Cost Type	Amount ($)
2008	Initial Local Air District Registration Fees Start	145 to 190
2009	Annual Registration Renewal Fees Start (low-end cost scenario)	26
2009	Annual Registration Renewal (non-inspection) Fees Start (high-end cost scenario)	75
Emission Standard Compliance Date - Varies by Specific Subcategory	Annual Registration Renewal (inspection) Fees Start (high-end cost scenario)	242
Emission Standard Compliance Date - Varies by Specific Subcategory	Engine Loss-of-Use Costs; duration: amortization period (see Table F-2)	Varies by Engine Subcategory

These costs are multiplied by the appropriate affected engine subcategory population as explained in Section F below, to produce a total cost for the subcategory. Using a low-and high-end cost for local air district fees produces a cost range for each subcategory. This process is performed for all 41 subcategories and the sum of the subcategories is the total cost range for the proposed amendments. These calculations are shown on the "Reg Cost" worksheet; a year-by-year summary table is provided on the "Reg Cost Summary" worksheet in this appendix.

E. Analysis Period Selection

While the standard economic analysis period for proposed regulations is typically the current State fiscal year (July 1 to June 30) and the following two fiscal years (DOF, 2006), the proposed amendments have rolling implementation dates from 2011 to 2022, where the majority of the cost attributable to the amendments will occur. As explained in Chapter VI, the amortization periods for these costs range from one to eight years, depending upon the engine size category and model year. To capture all of the engine standard costs, the analysis period must encompass all of the amortization periods; the first engine category to meet the proposed standards must comply by December 31, 2010, with the last category having a compliance deadline of December 31, 2021, and an amortization period of eight years.

The local air district fees are expected to take effect in 2008; thus, the analysis period starts in 2008 and extends to 2029. While this is an unusually long analysis period, it does capture nearly all of the costs of the proposed amendments. The only costs not captured are the local air district fees for affected engines, which will continue for as long as applicable stationary diesel engines are kept in service.

F. Affected Engine Population

The engine population data used for the cost analysis is based upon the data and methodologies used elsewhere in this report. However, the affected engine population figures used for the cost analysis, including the cost-effectiveness figures, do not include compliance costs and emission reductions for the San Joaquin Valley Unified Air Pollution Control District and the South Coast Air Quality Management District, due to district rules affecting the same in-use agricultural engine categories as these proposed amendments.

However, because the population of each subcategory in its respective compliance year differs (is less than) from its value in 2008 (earlier than the compliance year), the appropriate 2008 population figure was developed. The 2008 population figure for each subcategory was used when calculating the initial local air district fees and renewal fee amounts. Starting in the compliance year, the appropriate affected engine population figure for that year was used from that point onward in the cost calculations.

Table F-2. Time Points and Amortization Periods for Affected Engines

Engine Size (horsepower) Category	Emission Tier	Compliance Date (start of amortization period)	Affected Engine Model Year (MY)	Assumed Rebuild Year	In-Use Engine Loss-of-Use Period (years)	Rebuild Loss-of-Use Period (years)
50 – 74	0	12/31/2011 (2012)	-1996	2006	4	4
"	1	12/31/2015 (2016)	-2003	2013	7	7
"	2	12/31/2015 (2016)	2004	2014	8	8
"	2	12/31/2016 (2017)	2005	2015	8	8
"	2	12/31/2017 (2018)	2006	2016	8	8
"	2	12/31/2018 (2019)	2007	2017	8	8
75 – 99	0	12/31/2011 (2012)	-1996	2006	4	4
"	1	12/31/2015 (2016)	-2003	2013	7	7
"	2	12/31/2015 (2016)	2004	2014	8	8
"	2	12/31/2016 (2017)	2005	2015	8	8
"	2	12/31/2017 (2018)	2006	2016	8	8
"	2	12/31/2018 (2019)	2007	2017	8	8
100 – 174	0	12/31/2010 (2011)	-1996	2006	5	5
"	1	12/31/2015 (2016)	-2002	2012	6	6
"	2	12/31/2015 (2016)	2003 - 2004	2014	8	8
"	2	12/31/2016 (2017)	2005	2015	8	8
"	2	12/31/2017 (2018)	2006	2016	8	8
175 – 299	0	12/31/2010 (2011)	-1996	2006	5	5
"	1	12/31/2014 (2015)	-2002	2012	7	7
"	2	12/31/2014 (2015)	2003	2013	8	8
"	2	12/31/2015 (2016)	2004	2014	8	8
"	2	12/31/2016 (2017)	2005	2015	8	8
300 – 599	0	12/31/2010 (2011)	-1996	2006	5	5
"	1	12/31/2014 (2015)	-2000	2010	5	5
"	2	12/21/2014 (2015)	-2003	2013	8	8
"	2	12/31/2015 (2016)	2004	2014	8	8
"	2	12/31/2016 (2017)	2005	2015	8	8

Table F-2 continues on the next page.

Table F-2. Time Points and Amortization Periods for Affected Engines (continued)

Engine Size (horsepower) Category	Emission Tier	Compliance Date (start of amortization period)	Affected Engine Model Year (MY)	Assumed Rebuild Year	In-Use Engine Loss-of-Use Period (years)	Rebuild Loss-of-Use Period (years)
600 – 750	0	12/31/2010 (2011)	-1996	2006	5	5
"	1	12/31/2014 (2015)	-2001	2011	6	6
"	2	12/31/2014 (2015)	2003	2013	8	8
"	2	12/31/2015 (2016)	2004	2014	8	8
"	2	12/31/2016 (2017)	2005	2015	8	8
> 750	0	12/31/2014 (2015)	-1996	2006	1	1
"	1	12/31/2014 (2015)	-2003	2013	8	8
"	1	12/31/2015 (2016)	2004	2014	8	8
"	1	12/31/2016 (2017)	2005	2015	8	8
"	2	12/31/2017 (2018)	2006	2016	8	8
"	2	12/31/2018 (2019)	2007	2017	8	8
"	2	12/31/2019 (2020)	2008	2018	8	8
"	2	12/31/2020 (2021)	2009	2019	8	8
"	2	12/31/2021 (2022)	2010	2020	8	8

REFERENCES FOR APPENDIX F

DOF, 2006. State of California, Department of Finance, State Administrative Manual, Section 6622, Cost Estimating Format and Methodology (Revised 2/98). September, 2006. www.dof.ca.gov/fisa/bag/SAM6000.htm

Keddie, 2006. April 7, 2006 e-mail from Elise Keddie, PhD, ARB, to Jon Manji, ARB.

USDA, 2002b. United States Department of Agriculture National Agricultural Statistics Service. 2002 Census of Agriculture: Farm and Ranch Irrigation Survey (2003). Volume 3, Special Studies, Part 1. November 2004.

Walter, 2005-2006. Confidential. Personal Communication (telephone and in-person conversations) with engine dealers and distributors to Ron Walter, ARB, Stationary Source Division, November, 2005 to February, 2006.

"Engine Population" worksheet

8/25/2006

Note: These numbers take into account the 20% reduction due to electrification incentive programs and "electrification effect" of proposed amendments.
This worksheet takes the engine population figures used in the emission inventory and adjusts them as necessary.

Source: ARB PTSD 8/16/2006 file

Key to Abbreviations:

Engine Horsepower (hp) Categories:
5074 = 50 to 74 hp
7599 = 75 to 99 hp
100174 = 100 to 174 hp
175199 = 175 to 199 hp
300599 = 300 to 599 hp
600750 = 600 to 750 hp
GT750 = Greater Than 750 hp

SW = Statewide Total Engine Population Minus San Joaquin Subtotal
SJ = San Joaquin District Engine Population
SC = South Coast District Engine Population

2005, etc. = Calendar Year (Year After Horsepower/Engine Model Year Category Compliance Deadline)

T0 = EPA Tier 0 Engine
T1 = EPA Tier 1 Engine
T2 = EPA Tier 2 Engine

NOTE: SJV Subtotals Subtracted From Statewide Figures (including 2008 engine pop.)

Engine Horsepower Category	Number of Engines	Adjustment Factor	Status	Adjusted Eng. Popul.	Status	2008 Affected Engine Population *	
5074SW2012T0	68	1	Final	32	Final	54	
5074SW2016T1	104	1	Final	49	Final	71	
5074SW2016T2	7	1	Final	3	Final	5	
5074SW2017T2	7	1	Final	3	Final	5	
5074SW2018T2	8	1	Final	4	Final	5	
5074SW2019T2	9	1	Final	4	Final	5	
							145
5074SJ2012T0	36	1	Final	36	Final	60	
5074SJ2016T1	55	1	Final	55	Final	82	
5074SJ2016T2	4	1	Final	4	Final	5	
5074SJ2017T2	4	1	Final	4	Final	5	
5074SJ2018T2	4	1	Final	4	Final	6	
5074SJ2019T2	5	1	Final	5	Final	6	
							164
5074SC2012T0	0	1	Final	0	Final	1	
5074SC2016T1	0	1	Final	0	Final	0	
5074SC2016T2	0	1	Final	0	Final	0	
5074SC2017T2	0	1	Final	0	Final	0	
5074SC2018T2	0	1	Final	0	Final	0	
5074SC2019T2	0	1	Final	0	Final	0	
							1
7599SW2012T0	68	1	Final	32	Final	54	
7599SW2016T1	104	1	Final	49	Final	71	
7599SW2016T2	7	1	Final	3	Final	5	
7599SW2017T2	7	1	Final	3	Final	5	
7599SW2018T2	8	1	Final	4	Final	5	
7599SW2019T2	9	1	Final	4	Final	5	
							145
7599SJ2012T0	36	1	Final	36	Final	60	
7599SJ2016T1	55	1	Final	55	Final	82	
7599SJ2016T2	4	1	Final	4	Final	5	
7599SJ2017T2	4	1	Final	4	Final	5	
7599SJ2018T2	4	1	Final	4	Final	6	
7599SJ2019T2	5	1	Final	5	Final	6	
							164
7599SC2012T0	0	1	Final	0	Final	1	
7599SC2016T1	0	1	Final	0	Final	0	
7599SC2016T2	0	1	Final	0	Final	0	
7599SC2017T2	0	1	Final	0	Final	0	
7599SC2018T2	0	1	Final	0	Final	0	
7599SC2019T2	0	1	Final	0	Final	0	
							1
100174SW2011T0	895	1	Final	447	Final	689	
100174SW2016T1	1106	1	Final	553	Final	829	
100174SW2016T2	349	1	Final	174	Final	242	
100174SW2017T2	94	1	Final	47	Final	65	
100174SW2018T2	98	1	Final	49	Final	68	
							1893
100174SJ2011T0	448	1	Final	448	Final	689	
100174SJ2016T1	553	1	Final	553	Final	829	
100174SJ2016T2	175	1	Final	175	Final	245	
100174SJ2017T2	47	1	Final	47	Final	66	
100174SJ2018T2	49	1	Final	49	Final	69	
							1898
100174SC2011T0	0	1	Final	0	Final	0	
100174SC2016T1	0	1	Final	0	Final	0	
100174SC2016T2	0	1	Final	0	Final	0	
100174SC2017T2	0	1	Final	0	Final	0	
100174SC2018T2	0	1	Final	0	Final	0	
							0
175299SW2011T0	539	1	Final	199	Final	310	
175299SW2015T1	757	1	Final	268	Final	387	
175299SW2015T2	188	1	Final	66	Final	88	
175299SW2016T2	60	1	Final	22	Final	30	
175299SW2017T2	61	1	Final	23	Final	31	
							846
175299SJ2011T0	340	1	Final	340	Final	529	
175299SJ2015T1	489	1	Final	489	Final	705	
175299SJ2015T2	122	1	Final	122	Final	167	
175299SJ2016T2	38	1	Final	38	Final	52	

		Engine Tiers as a % of Total:	Air District as a % of Total
Subtotal- All Tier 0 SW:	792	35	
Subtotal- All Tier 1 SW:	963	43	
Subtotal- All Tier 2 SW:	489	22	
Total- All Tiers SW:	2244		
Subtotal- All Tier 0 SJ:	1051	35	
Subtotal- All Tier 1 SJ:	1258	42	
Subtotal- All Tier 2 SJ:	704	23	
Total- All Tiers SJ:	3013		
Subtotal- All Tier 0 SC:	2	50	
Subtotal- All Tier 1 SC:	1	25	
Subtotal- All Tier 2 SC:	1	25	
Total- All Tiers SC:	4		
Total- All SW (ex. SJV) 20(	3333		

175299SJ2017T2	38	1 Final	38 Final	53	
					1506
175299SC2011T0	1	1 Final	1 Final	1	
175299SC2015T1	1	1 Final	1 Final	1	
175299SC2015T2	0	1 Final	0 Final	0	
175299SC2016T2	0	1 Final	0 Final	0	
175299SC2017T2	0	1 Final	0 Final	0	
					2
300599SW2011T0	255	1 Final	76 Final	119	
300599SW2015T1	139	1 Final	40 Final	58	
300599SW2015T2	216	1 Final	59 Final	82	
300599SW2016T2	27	1 Final	8 Final	12	
300599SW2017T2	28	1 Final	9 Final	11	
					282
300599SJ2011T0	179	1 Final	179 Final	278	
300599SJ2015T1	99	1 Final	99 Final	148	
300599SJ2015T2	156	1 Final	156 Final	216	
300599SJ2016T2	19	1 Final	19 Final	26	
300599SJ2017T2	19	1 Final	19 Final	27	
					695
300599SC2010T0	1	1 Final	1 Final	1	
300599SC2015T1	0	1 Final	0 Final	1	
300599SC2015T2	1	1 Final	1 Final	1	
300599SC2016T2	0	1 Final	0 Final	0	
300599SC2017T2	0	1 Final	0 Final	0	
					3
600750SW2015T0	17	1 Final	6 Final	10	
600750SW2015T1	11	1 Final	4 Final	6	
600750SW2015T2	7	1 Final	2 Final	4	
600750SW2016T2	2	1 Final	1 Final	1	
600750SW2017T2	2	1 Final	1 Final	1	
					22
600750SJ2015T0	11	1 Final	11 Final	16	
600750SJ2015T1	7	1 Final	7 Final	10	
600750SJ2015T2	5	1 Final	5 Final	6	
600750SJ2016T2	1	1 Final	1 Final	2	
600750SJ2017T2	1	1 Final	1 Final	2	
					36
600750SC2015T0	0	1 Final	0 Final	0	
600750SC2015T1	0	1 Final	0 Final	0	
600750SC2015T2	0	1 Final	0 Final	0	
600750SC2016T2	0	1 Final	0 Final	0	
600750SC2017T2	0	1 Final	0 Final	0	
					0
GT750SW2015T0	1	1 Final	0 Final	0	
GT750SW2015T1	0	1 Final	0 Final	0	
GT750SW2016T1	0	1 Final	0 Final	0	
GT750SW2017T1	0	1 Final	0 Final	0	
GT750SW2018T2	0	1 Final	0 Final	0	
GT750SW2019T2	0	1 Final	0 Final	0	
GT750SW2020T2	0	1 Final	0 Final	0	
GT750SW2021T2	0	1 Final	0 Final	0	
GT750SW2022T2	0	1 Final	0 Final	0	
					0
GT750SJ2015T0	1	1 Final	1 Est.	1	
GT750SJ2015T1	0	1 Final	0 Est.	2	
GT750SJ2016T1	0	1 Final	0 Est.	0	
GT750SJ2017T1	0	1 Final	0 Est.	0	
GT750SJ2018T2	0	1 Final	0 Est.	0	
GT750SJ2019T2	0	1 Final	0 Est.	0	
GT750SJ2020T2	0	1 Final	0 Est.	0	
GT750SJ2021T2	0	1 Final	0 Est.	0	
GT750SJ2022T2	0	1 Final	0 Est.	0	
					3
GT750SC2015T0	0	1 Final	0 Est.	0	
GT750SC2015T1	0	1 Final	0 Est.	0	
GT750SC2016T1	0	1 Final	0 Est.	0	
GT750SC2017T1	0	1 Final	0 Est.	0	
GT750SC2018T2	0	1 Final	0 Est.	0	
GT750SC2019T2	0	1 Final	0 Est.	0	
GT750SC2020T2	0	1 Final	0 Est.	0	
GT750SC2021T2	0	1 Final	0 Est.	0	
GT750SC2022T2	0	1 Final	0 Est.	0	
					0

[a] Used for initial engine registration calculations; registration assumed to start in 2008

"Engine&Motor Costs" worksheet 9/1/2006

This worksheet compiles the diesel engine and electric motor cost figures and adjusts them as necessary.

Two scenarios are shown, the first assuming a low-end air district fee of $45, and the second assuming a high-end air district fee of $90
Both scenarios include an owner/operator cost of $100 (2 hrs. @ $50/hr.) for completion of air district application forms.

Diesel Engine Costs [5]

Engine HP Category	Power Unit Cost (2005 $)[1]	Installation Cost (2005 $)[2]	Rebuild Cost (2005 $)[3]	New Compliant Engine Cost	Remanufactured Engine Cost	Adjusted Engine Cost (2005 $)	Adjusted Rebuild Cost (? $)[6]	Adjusted Reman. Cost	Adjusted New Engine Cost
50 - 74	$9,000.00	$2,000.00	$4,500.00	$9,000.00	$0.00	$11,000.00	$4,500.00	$0.00	$9,000.00
75 - 99	$10,700.00	$2,000.00	$5,350.00	$10,700.00	$0.00	$12,700.00	$5,350.00	$0.00	$10,700.00
100 - 174	$14,600.00	$2,000.00	$7,300.00	$14,600.00	$0.00	$16,600.00	$7,300.00	$0.00	$14,600.00
175 - 299	$21,200.00	$2,000.00	$10,600.00	$21,200.00	$0.00	$23,200.00	$10,600.00	$0.00	$21,200.00
300 - 599	$31,100.00	$3,500.00	$15,550.00	$31,100.00	$0.00	$34,600.00	$15,550.00	$0.00	$31,100.00
600 - 750	$38,900.00	$3,500.00	$19,450.00	$38,900.00	$0.00	$42,400.00	$19,450.00	$0.00	$38,900.00
>750 (1720) [4]	$215,625.00	$14,500.00	$100,000.00	$215,625.00	$0.00	$230,125.00	$100,000.00	$0.00	$215,625.00

[1] Includes cost of base engine and basic accessory equipment (air cleaner, exhaust system, cooling system, & basic control panel. Typically referred to as a "power unit."
No weatherproofing enclosures or concrete mounting pad included, assumes existing enclosures (if any) and mounting pad are reused.
[2] Includes standard installation, avearage dealer-to-installation site distance.
[3] Avg. rebuild price of this size engine by dealer-- will vary considerably depending upon extent of work needed and engine condition at time of rebuild. Assumed to be 50% of power unit cost (slightly less than 50% for >750 hp cat.)
[4] Since this is an open-ended category, an assumed size had to be used for estimation purposes. Air District records showed this size engine as the largest in this application category. A rate of $125/hp was to estimate the cost.
[5] References: Keddie, 2006; Walter, 2005-2006

Electric Motor Costs Basis: Table 3-1, Installed Cost Estimates for IC Engine Electrification, Electrification of IC Engines Within the SCE Service Territory, AUS-20074, Final Report - June 1989

Engine HP Category	Capital Cost.[a]	Installation Cost (2005.$)[b]	Line Extension Cost (2005.$)[c]	Total Cap. Elect. Cost (2005 $)[e]
50 - 74	$15,455.64	$0.00	$1,600.00	$17,055.64
75 - 99	$17,955.18	$0.00	$1,600.00	$19,555.18
100 - 174	$25,890.38	$0.00	$1,600.00	$27,490.38
175 - 299	$46,170.45	$0.00	$1,600.00	$47,770.45
300 - 599	$117,685.53	$0.00	$1,600.00	$119,285.53
600 - 750	$147,352.50	$0.00	$1,600.00	$148,952.50
>750 (1720)[f]	$281,607.00	$0.00	$1,600.00	$283,207.00

[a] Capital cost for electric motor and accessories needed for installation; includes installation cost.
[b] Installation costs included in individual component costs
[c] Assumed average cost; actual is site-specific, depending upon electrical service size and distance from existing suitable supply to motor site.
[d] Air district fees for initial installation and application, plus owner/operator time to prepare application. Renewal fees are listed on Reg Cost worksheet.
[e] Total estimated capital cost of switching from diesel engine to electric motor (used on Reg Cost and Reg Cost + Replacement Cost worksheets in this Excel file.)
[f] 1720 HP used for this category as it is the largest known in-use engine in this category

Breakout of Estimated Component Costs
Source: Table 3-1, Installed Cost Estimates for IC Engine Electrification, Electrification of IC Engines Within the SCE Service Territory, AUS-20074, Final Report - June 1989
Note: Costs in Table 3-1 expressed on a per-horsepower basis; the maximum horsepower in each diesel engine category was multiplied by the component cost ($/HP) to given an estimated cost.
Because this report was published in 1989, the subtotal is expressed in 1989 dollars; the Total columm gives the estimated cost in 2005 dollars (assumed interest rate of 5%.)

Diesel Engine HP	Motor/Starter Cost (2005 $)[a]	Drive & Coupling	Instrumentation & Controls	Switchgear & Metering	Adjustable Spd. Drive	Isolation Transformer	Sub Total (1989 $)	Total in 2005 $
74	$7,080.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7,080.00	$15,455.64
99	$8,225.00	$0.00	$0.00	$0.00	$0.00	$0.00	$8,225.00	$17,955.18
174	$11,860.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11,860.00	$25,890.38
299	$21,150.00	$0.00	$0.00	$0.00	$0.00	$0.00	$21,150.00	$46,170.45

599	$53,910.00	$0.00	$0.00	$0.00	$0.00	$0.00	$53,910.00	$117,685.53
750	$67,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$67,500.00	$147,352.50
1720	$129,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$129,000.00	$281,607.00

Quoted/Scaled Electric Motor Costs Installed w/accessories + line ext. charge of $1600

Engine HP Category	Diesel Engine HP	Electric Motor Equiv. HP	$/HP	Avg. Line Ext. Charge [1]	Adjustable Spd. Drive	Total Cost	Comments
50-74	74	55	59.2	$4,817.18	$0.00	$10,417.18	Use 50 HP Costs
75-99	99	74	77.8	$6,444.61	$0.00	$13,524.61	Use 75 HP Costs
100-174	174	130	55.36	$11,326.89	$0.00	$20,351.89	Use 125 HP Costs
175-299	299	223	67.22	$19,464.02	$0.00	$38,659.02	Use 250 HP Costs
300-599	599	447	$65.93	$38,993.14	$0.00	$68,432.24	Use scaled-up costs from 400 HP motor
600-750	750	559	$65.93	$48,822.80	$0.00	$85,683.11	Use scaled-up costs from 400 HP motor
>750	1720	1282	$65.93	$111,966.94	$0.00	$196,499.93	Use scaled-up costs from 400 HP motor

[1] AUS-20074 Ref. $40/hp * 2.183 PV conversion

Quoted Prices - Electric Motors (from Ron W.)

Motor Size (HP)	Motor	Control Panel	Service or Installation	Poss. Add'l Labor	Total
50	$2,200.00	$1,600.00	$1,800.00	$0.00	$5,600.00
75	$3,680.00	$1,600.00	$1,800.00	$0.00	$7,080.00
100	$3,925.00	$1,800.00	$2,500.00	$800.00	$9,025.00
125	$4,740.00	$3,100.00	$2,500.00	$800.00	$11,140.00
150	$5,760.00	$3,100.00	$3,000.00	$800.00	$12,660.00
200	$7,828.00	$3,300.00	$3,500.00	$800.00	$15,428.00
250	$11,395.00	$3,300.00	$3,500.00	$1,000.00	$19,195.00
300	$13,650.00	$3,500.00	$4,000.00	$1,000.00	$22,150.00
350	$15,780.00	$3,500.00	$4,000.00	$1,000.00	$24,280.00
400	$17,870.00	$3,500.00	$4,000.00	$1,000.00	$26,370.00

"Reg Cost Summary" Worksheet 8/16/2006

Note: "Overall Cost" includes in-use engine loss of use cost, local air district registration fees, and engine owner/operator time to prepare and submit registration application.
Fee subtotals shown below (highlighted in blue) include an assumed range of air district fees plus an affected engine owner/operator time allowance to prepare and submit registration application.

Summary Table of Cost of Proposed Amendments

Engine Horsepower (hp) Category		Year 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	
50 - 74 hp																								
Engine Subtotal (in 2005 $):	Low	$0	$0	$0	$0	$60,461	$60,461	$60,461	$60,461	$62,983	$66,696	$71,646	$76,597	$76,597	$76,597	$76,597	$17,326	$13,614	$9,901	$4,950	$0	$0	$0	
	High	$0	$0	$0	$0	$60,461	$60,461	$60,461	$60,461	$62,983	$66,696	$71,646	$76,597	$76,597	$76,597	$76,597	$17,326	$13,614	$9,901	$4,950	$0	$0	$0	
Fee Subtotal (in 2005 $)	Low	$21,025	$3,770	$3,770	$3,770	$3,198	$3,198	$3,198	$3,198	$2,574	$2,522	$2,496	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	
	High	$27,550	$10,875	$10,875	$10,875	$14,569	$14,569	$14,569	$14,569	$21,453	$21,804	$22,397	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	
Category Cost Range (in 2005 $):	Low	$21,025	$3,770	$3,770	$3,770	$63,659	$63,659	$63,659	$63,659	$65,557	$69,218	$74,142	$79,067	$79,067	$79,067	$79,067	$19,796	$16,084	$12,371	$7,420	$2,470	$2,470	$2,470	$875,236
	High	$27,550	$10,875	$10,875	$10,875	$75,030	$75,030	$75,030	$75,030	$84,436	$88,500	$94,043	$99,587	$99,587	$99,587	$99,587	$40,316	$36,604	$32,891	$27,940	$22,990	$22,990	$22,990	$1,232,342
75 - 99 hp																								
Engine Subtotal (in 2005 $):	Low	$0	$0	$0	$0	$37,404	$37,404	$37,404	$37,404	$73,690	$78,034	$83,826	$89,618	$89,618	$89,618	$89,618	$20,272	$15,928	$11,584	$5,792	$0	$0	$0	
	High	$0	$0	$0	$0	$37,404	$37,404	$37,404	$37,404	$73,690	$78,034	$83,826	$89,618	$89,618	$89,618	$89,618	$20,272	$15,928	$11,584	$5,792	$0	$0	$0	
Fee Subtotal (in 2005 $)	Low	$21,025	$3,770	$3,770	$3,770	$3,198	$3,198	$3,198	$3,198	$2,574	$2,522	$2,496	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	$2,470	
	High	$27,550	$10,875	$10,875	$10,875	$14,569	$14,569	$14,569	$14,569	$21,453	$21,804	$22,397	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	$22,990	
Category Cost Range (in 2005 $):	Low	$21,025	$3,770	$3,770	$3,770	$40,602	$40,602	$40,602	$40,602	$76,264	$80,556	$86,322	$92,088	$92,088	$92,088	$92,088	$22,742	$18,398	$14,054	$8,262	$2,470	$2,470	$2,470	$877,107
	High	$27,550	$10,875	$10,875	$10,875	$51,973	$51,973	$51,973	$51,973	$95,143	$99,838	$106,223	$112,608	$112,608	$112,608	$112,608	$43,262	$38,918	$34,574	$28,782	$22,990	$22,990	$22,990	$1,234,213
100 - 174 hp																								
Engine Subtotal (in 2005 $):	Low	$0	$0	$0	$805,405	$805,405	$805,405	$805,405	$805,405	$1,355,622	$1,446,363	$1,540,965	$1,540,965	$1,540,965	$1,540,965	$521,277	$521,277	$185,343	$94,602	$0	$0	$0	$0	
	High	$0	$0	$0	$805,405	$805,405	$805,405	$805,405	$805,405	$1,355,622	$1,446,363	$1,540,965	$1,540,965	$1,540,965	$1,540,965	$521,277	$521,277	$185,343	$94,602	$0	$0	$0	$0	
Fee Subtotal (in 2005 $)	Low	$274,485	$49,218	$49,218	$42,926	$42,926	$42,926	$42,926	$42,926	$33,982	$33,514	$33,020	$33,020	$33,020	$33,020	$33,020	$33,020	$33,020	$33,020	$33,020	$33,020	$33,020	$33,020	
	High	$359,670	$141,975	$141,975	$198,474	$198,474	$198,474	$198,474	$198,474	$294,083	$300,582	$307,340	$307,340	$307,340	$307,340	$307,340	$307,340	$307,340	$307,340	$307,340	$307,340	$307,340	$307,340	
Category Cost Range (in 2005 $):	Low	$274,485	$49,218	$49,218	$848,331	$848,331	$848,331	$848,331	$848,331	$1,389,604	$1,479,877	$1,573,985	$1,573,985	$1,573,985	$1,573,985	$554,297	$554,297	$218,363	$127,622	$33,020	$33,020	$33,020	$33,020	$15,366,654
	High	$359,670	$141,975	$141,975	$1,003,879	$1,003,879	$1,003,879	$1,003,879	$1,003,879	$1,649,705	$1,746,945	$1,848,305	$1,848,305	$1,848,305	$1,848,305	$828,617	$828,617	$492,683	$401,942	$307,340	$307,340	$307,340	$307,340	$20,234,102
175 - 299 hp																								
Engine Subtotal (in 2005 $):	Low	$0	$0	$0	$510,256	$510,256	$510,256	$510,256	$1,514,062	$1,064,250	$1,127,442	$1,127,442	$1,127,442	$1,127,442	$1,127,442	$304,969	$123,636	$63,192	$0	$0	$0	$0	$0	
	High	$0	$0	$0	$510,256	$510,256	$510,256	$510,256	$1,514,062	$1,064,250	$1,127,442	$1,127,442	$1,127,442	$1,127,442	$1,127,442	$304,969	$123,636	$63,192	$0	$0	$0	$0	$0	
Fee Subtotal (in 2005 $)	Low	$127,165	$22,802	$22,802	$19,110	$19,110	$19,110	$19,110	$15,444	$15,236	$15,028	$15,028	$15,028	$15,028	$15,028	$15,028	$15,028	$15,028	$15,028	$15,028	$15,028	$15,028	$15,028	
	High	$160,740	$63,450	$63,450	$88,358	$88,358	$88,358	$88,358	$133,561	$136,635	$139,876	$139,876	$139,876	$139,876	$139,876	$139,876	$139,876	$139,876	$139,876	$139,876	$139,876	$139,876	$139,876	
Category Cost Range (in 2005 $):	Low	$127,165	$22,802	$22,802	$529,366	$529,366	$529,366	$529,366	$1,529,506	$1,079,486	$1,142,470	$1,142,470	$1,142,470	$1,142,470	$1,142,470	$319,997	$138,664	$78,220	$15,028	$15,028	$15,028	$15,028	$15,028	$11,223,597
	High	$160,740	$63,450	$63,450	$598,614	$598,614	$598,614	$598,614	$1,647,623	$1,200,885	$1,267,318	$1,267,318	$1,267,318	$1,267,318	$1,267,318	$444,845	$263,512	$203,068	$139,876	$139,876	$139,876	$139,876	$139,876	$13,478,000
300 - 599 hp																								
Engine Subtotal (in 2005 $):	Low	$0	$0	$0	$288,357	$288,357	$288,357	$288,357	$679,990	$424,157	$460,746	$460,746	$460,746	$308,979	$308,979	$308,979	$69,114	$36,590	$0	$0	$0	$0	$0	
	High	$0	$0	$0	$288,357	$288,357	$288,357	$288,357	$679,990	$424,157	$460,746	$460,746	$460,746	$308,979	$308,979	$308,979	$69,114	$36,590	$0	$0	$0	$0	$0	
Fee Subtotal (in 2005 $)	Low	$40,890	$7,332	$7,332	$6,214	$6,214	$6,214	$6,214	$5,148	$5,044	$4,992	$4,992	$4,992	$4,992	$4,992	$4,992	$4,992	$4,992	$4,992	$4,992	$4,992	$4,992	$4,992	
	High	$53,580	$21,150	$21,150	$30,617	$30,617	$30,617	$30,617	$44,075	$45,111	$46,464	$46,464	$46,464	$46,464	$46,464	$46,464	$46,464	$46,464	$46,464	$46,464	$46,464	$46,464	$46,464	
Category Cost Range (in 2005 $):	Low	$40,890	$7,332	$7,332	$294,571	$294,571	$294,571	$294,571	$685,138	$429,201	$465,738	$465,738	$465,738	$313,971	$313,971	$313,971	$74,106	$41,582	$4,992	$4,992	$4,992	$4,992	$4,992	$4,827,953
	High	$53,580	$21,150	$21,150	$318,974	$318,974	$318,974	$318,974	$724,065	$469,268	$507,210	$507,210	$507,210	$355,443	$355,443	$355,443	$115,578	$83,054	$46,464	$46,464	$46,464	$46,464	$46,464	$5,584,021
600 - 750 hp																								
Engine Subtotal (in 2005 $):	Low	$0	$0	$0	$28,170	$28,170	$28,170	$28,170	$57,451	$34,312	$39,343	$39,343	$39,343	$39,343	$20,123	$20,123	$10,062	$5,031	$0	$0	$0	$0	$0	
	High	$0	$0	$0	$28,170	$28,170	$28,170	$28,170	$57,451	$34,312	$39,343	$39,343	$39,343	$39,343	$20,123	$20,123	$10,062	$5,031	$0	$0	$0	$0	$0	
Fee Subtotal (in 2005 $)	Low	$3,190	$572	$572	$468	$468	$468	$468	$364	$364	$364	$364	$364	$364	$364	$364	$364	$364	$364	$364	$364	$364	$364	
	High	$4,180	$1,650	$1,650	$2,352	$2,352	$2,352	$2,352	$3,054	$3,221	$3,388	$3,388	$3,388	$3,388	$3,388	$3,388	$3,388	$3,388	$3,388	$3,388	$3,388	$3,388	$3,388	
Category Cost Range (in 2005 $):	Low	$3,190	$572	$572	$28,638	$28,638	$28,638	$28,638	$57,815	$34,676	$39,707	$39,707	$39,707	$39,707	$20,487	$20,487	$10,426	$5,395	$364	$364	$364	$364	$364	$428,821
	High	$4,180	$1,650	$1,650	$30,522	$30,522	$30,522	$30,522	$60,505	$37,533	$42,731	$42,731	$42,731	$42,731	$23,511	$23,511	$13,450	$8,419	$3,388	$3,388	$3,388	$3,388	$3,388	$484,382
Greater Than 750 hp																								
Engine Subtotal (in 2005 $)	Low	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	High	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Fee Subtotal (in 2005 $)	Low	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
	High	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	
Category Cost Range (in 2005 $):	Low	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
	High	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Ann. Totals- All EHP Cat. (in 2005 $):	Low	$0	$0	$0	$1,632,188	$1,730,054	$1,730,054	$1,730,054	$3,154,773	$3,015,014	$3,218,624	$3,323,969	$3,334,711	$3,182,944	$3,163,725	$1,321,564	$761,687	$319,697	$116,087	$10,742	$0	$0	$0	$31,745,885
	High	$0	$0	$0	$1,632,188	$1,730,054	$1,730,054	$1,730,054	$3,154,773	$3,015,014	$3,218,624	$3,323,969	$3,334,711	$3,182,944	$3,163,725	$1,321,564	$761,687	$319,697	$116,087	$10,742	$0	$0	$0	$31,745,885
Ann. Totals- All Fee Cat. (in 2005 $):	Low	$487,780	$87,464	$87,464	$76,258	$75,114	$75,114	$75,114	$70,278	$59,774	$58,542	$58,396	$58,344	$58,344	$58,344	$58,344	$58,344	$58,344	$58,344	$58,344	$58,344	$58,344	$58,344	$1,853,482
	High	$633,270	$249,975	$249,975	$341,551	$348,939	$348,939	$348,939	$408,302	$521,956	$533,918	$541,862	$543,048	$543,048	$543,048	$543,048	$543,048	$543,048	$543,048	$543,048	$543,048	$543,048	$543,048	$10,501,154
All Categories Cost Range (in 2005 $):	Low	$487,780	$87,464	$87,464	$1,708,446	$1,805,168	$1,805,168	$1,805,168	$3,225,051	$3,074,788	$3,277,166	$3,382,365	$3,393,055	$3,241,288	$3,222,069	$1,379,908	$820,031	$378,041	$174,431	$69,086	$58,344	$58,344	$58,344	$33,599,367
	High	$633,270	$249,975	$249,975	$1,973,739	$2,078,993	$2,078,993	$2,078,993	$3,563,075	$3,536,970	$3,752,542	$3,865,831	$3,877,759	$3,725,992	$3,706,773	$1,864,612	$1,304,735	$862,745	$659,135	$553,790	$543,048	$543,048	$543,048	$42,247,039

"Reg Cost" Worksheet

8/17/2006

This worksheet calculates the cost figures and adjusts them as necessary.

Key to Abbreviations:

Loss of Use Calculation
Since the ATCM is structured to require the replacement of in-use engines with new engines, and new engines will already be compliant with standards, the cost of complying with the ATCM will be the amount of engine life lost by early replacement of the engine.

Assumptions:
20-year engine life (median life is 20 years in emission inventory calculations as is a 40-year total life; a 20-year period is used here because nearly all farms would not be paying for an engine for 40 years.)
SV Engine = 0
SV Rebuild = 0

Diesel Engine Lost Use Cost = (Installed Engine Price x Adjustment Factor 1) + (Rebuild Price x Adjustment Factor 2 x Present Value Factor)

Adjustment Factor 1 = Prorating of Remaining Useful Engine Life
(20 Yr. Life - Engine Age @ ATCM Compliance Yr.) / 20

Adjustment Factor 2 = PV Engine Lost Use
Adjustment Factor 3 = Prorating for Rebuild Lost Use

Present Value Factor = From Table, I = 5%, brings back to first year the rebuild cost $.

Engine Category (Compl. Yr + 1)	# of In-Use Engines[1]	2008 Eng. Pop.	In-Use Engine MY	Adjustment Factor 1	Rebuild MY	Adjustment Factor 2	Adjustment Factor 3	Total (eng+reb.) Engine Lost Use Cost /Engine (2005$)	Total This Engine Category	Per-Engine Annualized Cost	Total Annualized Amount ($)	Initial Air Dist. Fee Engine [a]	Annual Air Dist. Fee Engine [a]	Init. Air Dist. Fee Compliaint Engine [a]	Init. Air Dist. Fee Compliaint Engine [a]	Year 2008	2009	2010	2011
Low-End District Fees Scenario																			
50 - 74 hp																			
Statewide Total, Tier 0 (2012)	32	54	1996	0.2	2005	0.282	1	$6,700.00	$214,400.00	$1,889.40	$60,460.80	$145.00	$26.00	$26.00	$26.00	$7,830.00	$1,404.00	$1,404.00	$1,404.00
Statewide Total, Tier 1 (2016)	49	71	2003	0.35	2013	0.1728	0.7	$7,000.00	$343,000.00	$1,209.60	$59,270.40	$145.00	$26.00	$26.00	$26.00	$10,295.00	$1,846.00	$1,846.00	$1,846.00
Statewide Total, Tier 2 (2016)	3	5	2004	0.4	2014	0.1547	0.8	$8,000.00	$24,000.00	$1,237.60	$3,712.80	$145.00	$26.00	$26.00	$26.00	$725.00	$130.00	$130.00	$130.00
Statewide Total, Tier 2 (2017)	3	5	2005	0.4	2015	0.1547	0.8	$8,000.00	$24,000.00	$1,237.60	$3,712.80	$145.00	$26.00	$26.00	$26.00	$725.00	$130.00	$130.00	$130.00
Statewide Total, Tier 2 (2018)	4	5	2006	0.4	2016	0.1547	0.8	$8,000.00	$32,000.00	$1,237.60	$4,950.40	$145.00	$26.00	$26.00	$26.00	$725.00	$130.00	$130.00	$130.00
Statewide Total, Tier 2 (2019)	4	5	2007	0.4	2017	0.1547	0.8	$8,000.00	$32,000.00	$1,237.60	$4,950.40	$145.00	$26.00	$26.00	$26.00	$725.00	$130.00	$130.00	$130.00
Engine Subtotals (in 2005 $):									$669,400.00		$137,057.60					$0.00	$0.00	$0.00	$0.00
Fee Subtotals (in 2005$)																$21,025.00	$3,770.00	$3,770.00	$3,770.00
75 - 99 hp																			
Statewide Total, Tier 0 (2012)	32	54	1996	0.2	2005	0.282	0.3	$4,145.00	$132,640.00	$1,168.89	$37,404.48	$145.00	$26.00	$26.00	$26.00	$7,830.00	$1,404.00	$1,404.00	$1,404.00
Statewide Total, Tier 1 (2016)	49	71	2003	0.35	2013	0.1728	0.7	$8,190.00	$401,310.00	$1,415.23	$69,346.37	$145.00	$26.00	$26.00	$26.00	$10,295.00	$1,846.00	$1,846.00	$1,846.00
Statewide Total, Tier 2 (2016)	3	5	2004	0.4	2014	0.1547	0.8	$9,360.00	$28,080.00	$1,447.99	$4,343.98	$145.00	$26.00	$26.00	$26.00	$725.00	$130.00	$130.00	$130.00
Statewide Total, Tier 2 (2017)	3	5	2005	0.4	2015	0.1547	0.8	$9,360.00	$28,080.00	$1,447.99	$4,343.98	$145.00	$26.00	$26.00	$26.00	$725.00	$130.00	$130.00	$130.00
Statewide Total, Tier 2 (2018)	4	5	2006	0.4	2016	0.1547	0.8	$9,360.00	$37,440.00	$1,447.99	$5,791.97	$145.00	$26.00	$26.00	$26.00	$725.00	$130.00	$130.00	$130.00
Statewide Total, Tier 2 (2019)	4	5	2007	0.4	2017	0.1547	0.8	$9,360.00	$37,440.00	$1,447.99	$5,791.97	$145.00	$26.00	$26.00	$26.00	$725.00	$130.00	$130.00	$130.00
Engine Subtotals (in 2005 $):									$664,990.00		$127,022.74					$0.00	$0.00	$0.00	$0.00
Fee Subtotals (in 2005$):																$21,025.00	$3,770.00	$3,770.00	$3,770.00
100 - 174 hp																			$805,404.60
Statewide Total, Tier 0 (2011)	447	689	1996	0.25	2006	0.231	0.5	$7,800.00	$3,486,600.00	$1,801.80	$805,404.60	$145.00	$26.00	$26.00	$26.00	$99,905.00	$17,914.00	$17,914.00	$11,622.00
Statewide Total, Tier 1 (2016)	553	829	2002	0.3	2012	0.197	0.6	$9,360.00	$5,176,080.00	$1,843.92	$1,019,687.76	$145.00	$26.00	$26.00	$26.00	$120,205.00	$21,554.00	$21,554.00	$21,554.00
Statewide Total, Tier 2 (2016)	174	242	2004	0.4	2014	0.1547	0.8	$12,480.00	$2,171,520.00	$1,930.66	$335,934.14	$145.00	$26.00	$26.00	$26.00	$35,090.00	$6,292.00	$6,292.00	$6,292.00
Statewide Total, Tier 2 (2017)	47	65	2005	0.4	2015	0.1547	0.8	$12,480.00	$586,560.00	$1,930.66	$90,740.83	$145.00	$26.00	$26.00	$26.00	$9,425.00	$1,690.00	$1,690.00	$1,690.00
Statewide Total, Tier 2 (2018)	49	68	2006	0.4	2016	0.1547	0.8	$12,480.00	$611,520.00	$1,930.66	$94,602.14	$145.00	$26.00	$26.00	$26.00	$9,860.00	$1,768.00	$1,768.00	$1,768.00
Engine Subtotals (in 2005 $):									$12,032,280.00		$2,346,369.48					$0.00	$0.00	$0.00	$805,404.60
Fee Subtotals (in 2005$):																$274,485.00	$49,218.00	$49,218.00	$42,926.00
175 - 299 hp																			$510,255.90
Statewide Total, Tier 0 (2011)	199	310	1996	0.25	2006	0.231	0.5	$11,100.00	$2,208,900.00	$2,564.10	$510,255.90	$145.00	$26.00	$26.00	$26.00	$44,950.00	$8,060.00	$8,060.00	$5,174.00
Statewide Total, Tier 1 (2015)	268	387	2003	0.4	2013	0.1728	0.8	$17,760.00	$4,759,680.00	$3,068.93	$822,472.70	$145.00	$26.00	$26.00	$26.00	$56,115.00	$10,062.00	$10,062.00	$10,062.00
Statewide Total, Tier 2 (2015)	66	88	2003	0.4	2013	0.1547	0.8	$17,760.00	$1,172,160.00	$2,747.47	$181,333.15	$145.00	$26.00	$26.00	$26.00	$12,760.00	$2,288.00	$2,288.00	$2,288.00
Statewide Total, Tier 2 (2016)	22	30	2004	0.4	2014	0.1547	0.8	$17,760.00	$390,720.00	$2,747.47	$60,444.38	$145.00	$26.00	$26.00	$26.00	$4,350.00	$780.00	$780.00	$780.00
Statewide Total, Tier 2 (2017)	23	31	2005	0.4	2015	0.1547	0.8	$17,760.00	$408,480.00	$2,747.47	$63,191.86	$145.00	$26.00	$26.00	$26.00	$4,495.00	$806.00	$806.00	$806.00

Engine Subtotals (in 2005 $):									$8,939,940.00		$1,637,698.00					$0.00	$0.00	$0.00	$510,255.90
Fee Subtotals (in 2005$):																$127,165.00	$22,802.00	$22,802.00	$19,110.00
300 - 599 hp																			
Statewide Total, Tier 0 (2011)	76		1996	0.25	2006	0.231	0.5	$16,425.00	$1,248,300.00	$3,794.18	$288,357.30								$288,357.30
		119										$145.00	$26.00	$26.00	$26.00	$17,255.00	$3,094.00	$3,094.00	$1,976.00
Statewide Total, Tier 1 (2015)	40		2000	0.25	2010	0.231	0.5	$16,425.00	$657,000.00	$3,794.18	$151,767.00	$145.00	$26.00	$26.00	$26.00	$8,410.00	$1,508.00	$1,508.00	$1,508.00
		58										$145.00	$26.00	$26.00	$26.00	$11,690.00	$2,132.00	$2,132.00	$2,132.00
Statewide Total, Tier 2 (2015)	59		2003	0.4	2013	0.1547	0.8	$26,280.00	$1,550,520.00	$4,065.52	$239,865.44	$145.00	$26.00	$26.00	$26.00	$1,740.00	$312.00	$312.00	$312.00
		82										$145.00	$26.00	$26.00	$26.00	$1,595.00	$286.00	$286.00	$286.00
Statewide Total, Tier 2 (2016)	8		2004	0.4	2014	0.1547	0.8	$26,280.00	$210,240.00	$4,065.52	$32,524.13					$0.00	$0.00	$0.00	$288,357.30
		12														$40,690.00	$7,332.00	$7,332.00	$6,214.00
Statewide Total, Tier 2 (2017)	9		2005	0.4	2015	0.1547	0.8	$26,280.00	$236,520.00	$4,065.52	$36,589.64								
		11																	
Engine Subtotals (in 2005 $):									$3,902,580.00		$749,103.52								
Fee Subtotals (in 2005$):																			
600 - 750 hp																			
Statewide Total, Tier 0 (2011)	6		1996	0.25	2006	0.231	0.5	$20,325.00	$121,950.00	$4,695.08	$28,170.45								$28,170.45
		10										$145.00	$26.00	$26.00	$26.00	$1,450.00	$260.00	$260.00	$156.00
Statewide Total, Tier 1 (2015)	4		2001	0.3	2011	0.197	0.6	$24,390.00	$97,560.00	$4,804.83	$19,219.32	$145.00	$26.00	$26.00	$26.00	$870.00	$156.00	$156.00	$156.00
		6										$145.00	$26.00	$26.00	$26.00	$580.00	$104.00	$104.00	$104.00
Statewide Total, Tier 2 (2015)	2		2003	0.4	2013	0.1547	0.8	$32,520.00	$65,040.00	$5,030.84	$10,061.69	$145.00	$26.00	$26.00	$26.00	$145.00	$26.00	$26.00	$26.00
		4										$145.00	$26.00	$26.00	$26.00	$145.00	$26.00	$26.00	$26.00
Statewide Total, Tier 2 (2016)	1		2004	0.4	2014	0.1547	0.8	$32,520.00	$32,520.00	$5,030.84	$5,030.84					$0.00	$0.00	$0.00	$28,170.45
		1														$3,190.00	$572.00	$572.00	$468.00
Statewide Total, Tier 2 (2017)	1		2005	0.4	2015	0.1547	0.8	$32,520.00	$32,520.00	$5,030.84	$5,030.84								
		1																	
Engine Subtotals (in 2005 $):									$349,590.00		$67,513.15								
Fee Subtotals (in 2005$):																			
Greater Than 750 hp																			
Statewide Total, Tier 0 (2015)	0		1996	0.05	2006	1	0.1	$21,506.25	$0.00	$21,506.25	$0.00								
		0										$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2015)	0		2003	0.4	2013	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
		0										$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2016)	0		2004	0.4	2014	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
		0										$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2017)	0		2005	0.4	2015	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
		0										$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2018)	0		2006	0.4	2016	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
		0										$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2019)	0		2007	0.4	2017	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
		0										$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2020)	0		2008	0.4	2018	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
		0										$145.00	$26.00	$26.00	$26.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2021)	0		2009	0.4	2019	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00					$0.00	$0.00	$0.00	$0.00
		0														$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2022)	0		2010	0.4	2020	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00								
		0																	
Engine Subtotals (in 2005 $):									$0.00		$0.00								
Fee Subtotals (in 2005$):																			
Ann. Totals- All EHP Cat. (in 2005 $):																$0.00	$0.00	$0.00	$1,632,188.25
Ann. Totals- All Fee Cat. (in 2005 $):																$487,780.00	$87,464.00	$87,464.00	$76,258.00
																$487,780.00	$87,464.00	$87,464.00	$1,708,446.25

Total # Affected Engines:	2244 (all yrs.)	3333 (2008 pop.)

[1] affected engine population in year after compliance deadline
[2] includes operator owner cost to complete and submit application; 2hrs. @ $50/hr.

High-End District Fees Scenario

50 - 74 hp																			
Statewide Total, Tier 0 (2012)	32		1996	0.2	2005	0.282	1	$6,700.00	$214,400.00	$1,889.40	$60,460.80								
		54										$190.00	$75.00	$242.00	$242.00	$10,260.00	$4,050.00	$4,050.00	$4,050.00
Statewide Total, Tier 1 (2016)	49		2003	0.35	2013	0.1728	0.7	$7,000.00	$343,000.00	$1,209.60	$59,270.40	$190.00	$75.00	$242.00	$242.00	$13,490.00	$5,325.00	$5,325.00	$5,325.00
		71										$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
Statewide Total, Tier 2 (2016)	3		2004	0.4	2014	0.1547	0.8	$8,000.00	$24,000.00	$1,237.60	$3,712.80	$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
		5										$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
Statewide Total, Tier 2 (2017)	3		2005	0.4	2015	0.1547	0.8	$8,000.00	$24,000.00	$1,237.60	$3,712.80	$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
		5										$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
Statewide Total, Tier 2 (2018)	4		2006	0.4	2016	0.1547	0.8	$8,000.00	$32,000.00	$1,237.60	$4,950.40					$0.00	$0.00	$0.00	$0.00
		5														$27,550.00	$10,875.00	$10,875.00	$10,875.00
Statewide Total, Tier 2 (2019)	4		2007	0.4	2017	0.1547	0.8	$8,000.00	$32,000.00	$1,237.60	$4,950.40								
		5																	
Engine Subtotals (in 2005 $):									$669,400.00		$137,057.60								
Fee Subtotals (in 2005$)																			
75 - 99 hp																			
Statewide Total, Tier 0 (2012)	32		1996	0.2	2005	0.282	0.3	$4,145.00	$132,640.00	$1,168.89	$37,404.48								
		54										$190.00	$75.00	$242.00	$242.00	$10,260.00	$4,050.00	$4,050.00	$4,050.00
Statewide Total, Tier 1 (2016)	49		2003	0.35	2013	0.1728	0.7	$8,190.00	$401,310.00	$1,415.23	$69,346.37	$190.00	$75.00	$242.00	$242.00	$13,490.00	$5,325.00	$5,325.00	$5,325.00
		71										$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
Statewide Total, Tier 2 (2016)	3		2004	0.4	2014	0.1547	0.8	$9,360.00	$28,080.00	$1,447.99	$4,343.98	$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
		5																	
Statewide Total, Tier 2 (2017)	3		2005	0.4	2015	0.1547	0.8	$9,360.00	$28,080.00	$1,447.99	$4,343.98								
		5																	
Statewide Total, Tier 2 (2018)	4		2006	0.4	2016	0.1547	0.8	$9,360.00	$37,440.00	$1,447.99	$5,791.97								

Statewide Total, Tier 2 (2019)	4	5	2007	0.4	2017	0.1547	0.8	$9,360.00	$37,440.00	$1,447.99	$5,791.97	$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
		5										$190.00	$75.00	$242.00	$242.00	$950.00	$375.00	$375.00	$375.00
Engine Subtotals (in 2005 $):									$664,990.00		$127,022.74					$0.00	$0.00	$0.00	$0.00
Fee Subtotals (in 2005$):																$27,550.00	$10,875.00	$10,875.00	$10,875.00
100 - 174 hp																			$805,404.60
Statewide Total, Tier 0 (2011)	447	689	1996	0.25	2006	0.231	0.5	$7,800.00	$3,486,600.00	$1,801.80	$805,404.60	$190.00	$75.00	$242.00	$242.00	$130,910.00	$51,675.00	$51,675.00	$108,174.00
Statewide Total, Tier 1 (2016)	553		2002	0.3	2012	0.197	0.6	$9,360.00	$5,176,080.00	$1,843.92	$1,019,687.76	$190.00	$75.00	$242.00	$242.00	$157,510.00	$62,175.00	$62,175.00	$62,175.00
Statewide Total, Tier 2 (2016)	174	829	2004	0.4	2014	0.1547	0.8	$12,480.00	$2,171,520.00	$1,930.66	$335,934.14	$190.00	$75.00	$242.00	$242.00	$45,980.00	$18,150.00	$18,150.00	$18,150.00
Statewide Total, Tier 2 (2017)	47	242	2005	0.4	2015	0.1547	0.8	$12,480.00	$586,560.00	$1,930.66	$90,740.83	$190.00	$75.00	$242.00	$242.00	$12,350.00	$4,875.00	$4,875.00	$4,875.00
Statewide Total, Tier 2 (2018)	49	65	2006	0.4	2016	0.1547	0.8	$12,480.00	$611,520.00	$1,930.66	$94,602.14	$190.00	$75.00	$242.00	$242.00	$12,920.00	$5,100.00	$5,100.00	$5,100.00
		68														$0.00	$0.00	$0.00	$805,404.60
Engine Subtotals (in 2005 $):									$12,032,280.00		$2,346,369.48					$359,670.00	$141,975.00	$141,975.00	$198,474.00
Fee Subtotals (in 2005$):																			
175 - 299 hp																			$510,255.90
Statewide Total, Tier 0 (2011)	199	310	1996	0.25	2006	0.231	0.5	$11,100.00	$2,208,900.00	$2,564.10	$510,255.90	$190.00	$75.00	$242.00	$242.00	$58,900.00	$23,250.00	$23,250.00	$46,158.00
Statewide Total, Tier 1 (2015)	268		2003	0.4	2013	0.1728	0.8	$17,760.00	$4,759,680.00	$3,068.93	$822,472.70	$190.00	$75.00	$242.00	$242.00	$73,530.00	$29,025.00	$29,025.00	$29,025.00
Statewide Total, Tier 2 (2015)	66	387	2003	0.4	2013	0.1547	0.8	$17,760.00	$1,172,160.00	$2,747.47	$181,333.15	$190.00	$75.00	$242.00	$242.00	$16,720.00	$6,600.00	$6,600.00	$6,600.00
Statewide Total, Tier 2 (2016)	22	88	2004	0.4	2014	0.1547	0.8	$17,760.00	$390,720.00	$2,747.47	$60,444.38	$190.00	$75.00	$242.00	$242.00	$5,700.00	$2,250.00	$2,250.00	$2,250.00
Statewide Total, Tier 2 (2017)	23	30	2005	0.4	2015	0.1547	0.8	$17,760.00	$408,480.00	$2,747.47	$63,191.86	$190.00	$75.00	$242.00	$242.00	$5,890.00	$2,325.00	$2,325.00	$2,325.00
		31														$0.00	$0.00	$0.00	$510,255.90
Engine Subtotals (in 2005 $):									$8,939,940.00		$1,637,698.00					$160,740.00	$63,450.00	$63,450.00	$88,358.00
Fee Subtotals (in 2005$):																			
300 - 599 hp																			$288,357.30
Statewide Total, Tier 0 (2011)	76	119	1996	0.25	2006	0.231	0.5	$16,425.00	$1,248,300.00	$3,794.18	$288,357.30	$190.00	$75.00	$242.00	$242.00	$22,610.00	$8,925.00	$8,925.00	$18,392.00
Statewide Total, Tier 1 (2015)	40		2000	0.25	2010	0.231	0.5	$16,425.00	$657,000.00	$3,794.18	$151,767.00	$190.00	$75.00	$242.00	$242.00	$11,020.00	$4,350.00	$4,350.00	$4,350.00
Statewide Total, Tier 2 (2015)	59	58	2003	0.4	2013	0.1547	0.8	$26,280.00	$1,550,520.00	$4,065.52	$239,865.44	$190.00	$75.00	$242.00	$242.00	$15,580.00	$6,150.00	$6,150.00	$6,150.00
Statewide Total, Tier 2 (2016)	8	62	2004	0.4	2014	0.1547	0.8	$26,280.00	$210,240.00	$4,065.52	$32,524.13	$190.00	$75.00	$242.00	$242.00	$2,280.00	$900.00	$900.00	$900.00
Statewide Total, Tier 2 (2017)	9	12	2005	0.4	2015	0.1547	0.8	$26,280.00	$236,520.00	$4,065.52	$36,589.64	$190.00	$75.00	$242.00	$242.00	$2,090.00	$825.00	$825.00	$825.00
		11														$0.00	$0.00	$0.00	$288,357.30
Engine Subtotals (in 2005 $):									$3,902,580.00		$749,103.52					$53,580.00	$21,150.00	$21,150.00	$30,617.00
Fee Subtotals (in 2005$):																			
600 - 750 hp																			$28,170.45
Statewide Total, Tier 0 (2011)	6	10	1996	0.25	2006	0.231	0.5	$20,325.00	$121,950.00	$4,695.08	$28,170.45	$190.00	$75.00	$242.00	$242.00	$1,900.00	$750.00	$750.00	$1,452.00
Statewide Total, Tier 1 (2015)	4		2001	0.3	2011	0.197	0.6	$24,390.00	$97,560.00	$4,804.83	$19,219.32	$190.00	$75.00	$242.00	$242.00	$1,140.00	$450.00	$450.00	$450.00
Statewide Total, Tier 2 (2015)	2	6	2003	0.4	2013	0.1547	0.8	$32,520.00	$65,040.00	$5,030.84	$10,061.69	$190.00	$75.00	$242.00	$242.00	$760.00	$300.00	$300.00	$300.00
Statewide Total, Tier 2 (2016)	1	4	2004	0.4	2014	0.1547	0.8	$32,520.00	$32,520.00	$5,030.84	$5,030.84	$190.00	$75.00	$242.00	$242.00	$190.00	$75.00	$75.00	$75.00
Statewide Total, Tier 2 (2017)	1	1	2005	0.4	2015	0.1547	0.8	$32,520.00	$32,520.00	$5,030.84	$5,030.84	$190.00	$75.00	$242.00	$242.00	$190.00	$75.00	$75.00	$75.00
		1														$0.00	$0.00	$0.00	$28,170.45
Engine Subtotals (in 2005 $):									$349,590.00		$67,513.15					$4,180.00	$1,650.00	$1,650.00	$2,352.00
Fee Subtotals (in 2005$):																			
Greater Than 750 hp																			
Statewide Total, Tier 0 (2015)	0	0	1996	0.05	2006	1	0.1	$21,506.25	$0.00	$21,506.25	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2015)	0		2003	0.4	2013	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2016)	0	0	2004	0.4	2014	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2017)	0	0	2005	0.4	2015	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2018)	0	0	2006	0.4	2016	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2019)	0	0	2007	0.4	2017	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2020)	0	0	2008	0.4	2018	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2021)	0	0	2009	0.4	2019	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2022)	0	0	2010	0.4	2020	0.1547	0.8	$172,050.00	$0.00	$26,616.14	$0.00	$190.00	$75.00	$242.00	$242.00	$0.00	$0.00	$0.00	$0.00
		0														$0.00	$0.00	$0.00	$0.00
Engine Subtotals (in 2005 $):									$0.00		$0.00					$0.00	$0.00	$0.00	$0.00
Fee Subtotals (in 2005$):																			
Ann. Totals- All EHP Cat. (in 2005 $):																$0.00	$0.00	$0.00	$1,632,188.25
Ann. Totals- All Fee Cat. (in 2005 $):																$633,270.00	$249,975.00	$249,975.00	$341,551.00
																$633,270.00	$249,975.00	$249,975.00	$1,973,739.25

Total # Affected Engines:	2244 (all yrs.)	3333 (2008 pop.)

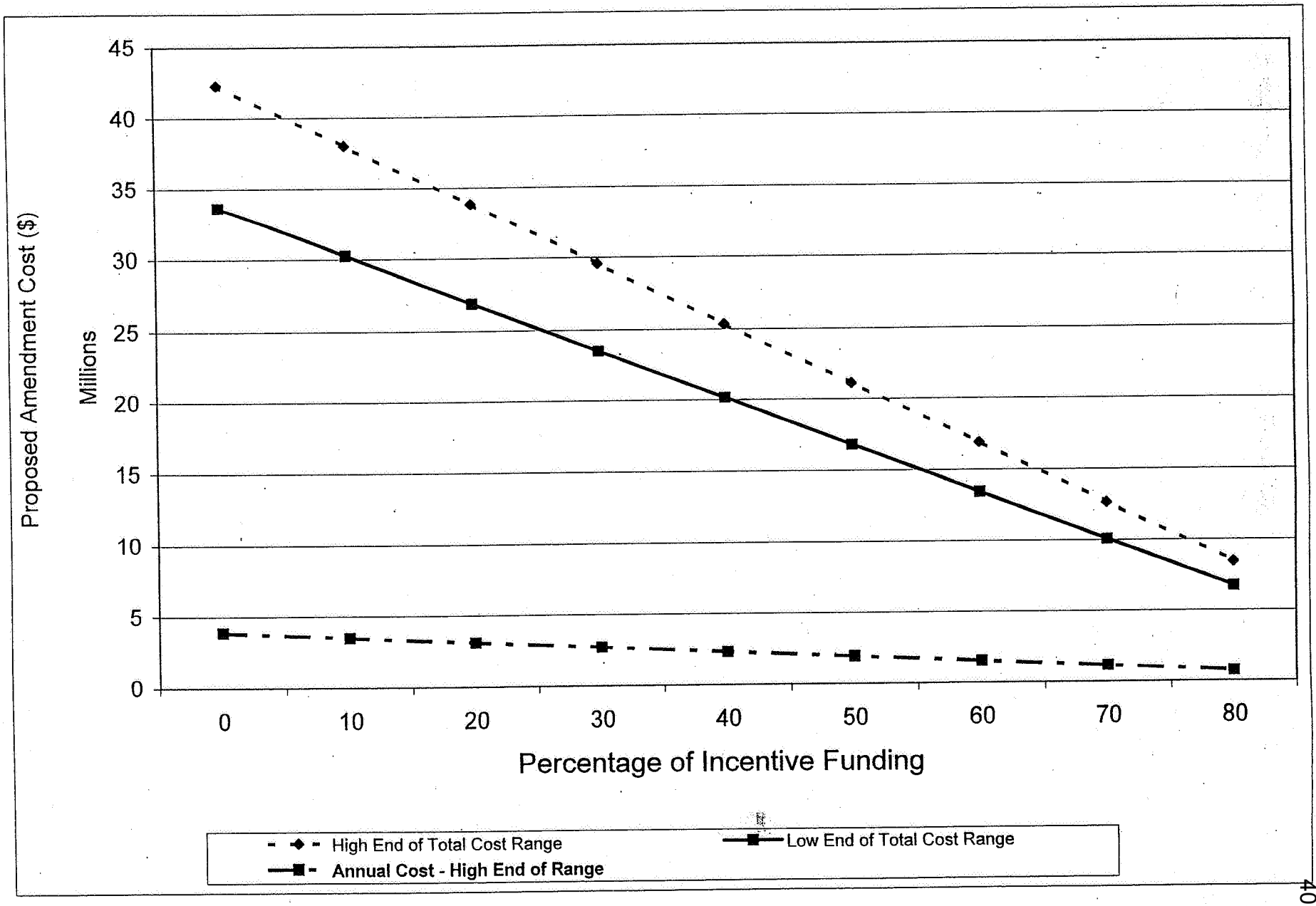
[1] affected engine population in year after compliance deadline

* includes operator owner cost to complete and submit application; 2hrs. @ $50/hr.

2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	NOT USED 2030	
$60,460.80	$60,460.80	$60,460.80	$60,460.80																
$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	
				$59,270.40	$59,270.40	$59,270.40	$59,270.40	$59,270.40	$59,270.40	$59,270.40									
$1,846.00	$1,846.00	$1,846.00	$1,846.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	
				$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80								
$130.00	$130.00	$130.00	$130.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	
					$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80	$3,712.80						
$130.00	$130.00	$130.00	$130.00	$130.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	
						$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40					
$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	
							$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40	$4,950.40					
$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	
$60,460.80	$60,460.80	$60,460.80	$60,460.80	$62,983.20	$66,696.00	$71,646.40	$76,596.80	$76,596.80	$76,596.80	$76,596.80	$17,326.40	$13,613.60	$9,900.80	$4,950.40	$0.00	$0.00	$0.00	$0.00	$795,347.20
$3,198.00	$3,198.00	$3,198.00	$3,198.00	$2,574.00	$2,522.00	$2,496.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$79,889.00
$37,404.48	$37,404.48	$37,404.48	$37,404.48																
$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	$832.00	
				$69,346.37	$69,346.37	$69,346.37	$69,346.37	$69,346.37	$69,346.37	$69,346.37									
$1,846.00	$1,846.00	$1,846.00	$1,846.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	
				$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98								
$130.00	$130.00	$130.00	$130.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	
					$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98	$4,343.98						
$130.00	$130.00	$130.00	$130.00	$130.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	$78.00	
						$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97						
$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	
							$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97					
$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$130.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	
$37,404.48	$37,404.48	$37,404.48	$37,404.48	$73,690.34	$78,034.32	$83,826.29	$89,618.26	$89,618.26	$89,618.26	$89,618.26	$20,271.89	$15,927.91	$11,583.94	$5,791.97	$0.00	$0.00	$0.00	$0.00	$797,217.60
$3,198.00	$3,198.00	$3,198.00	$3,198.00	$2,574.00	$2,522.00	$2,496.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$2,470.00	$79,889.00
$805,404.60	$805,404.60	$805,404.60	$805,404.60																
$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	$11,622.00	
				$1,019,687.76	$1,019,687.76	$1,019,687.76	$1,019,687.76	$1,019,687.76	$1,019,687.76	$1,019,687.76									
$21,554.00	$21,554.00	$21,554.00	$21,554.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	$14,378.00	
				$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14							
$6,292.00	$6,292.00	$6,292.00	$6,292.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	$4,524.00	
					$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83						
$1,690.00	$1,690.00	$1,690.00	$1,690.00	$1,690.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	$1,222.00	
						$94,602.14	$94,602.14	$94,602.14	$94,602.14	$94,602.14	$94,602.14	$94,602.14	$94,602.14						
$1,768.00	$1,768.00	$1,768.00	$1,768.00	$1,768.00	$1,768.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	$1,274.00	
$805,404.60	$805,404.60	$805,404.60	$805,404.60	$1,355,621.80	$1,446,362.74	$1,540,964.88	$1,540,964.88	$1,540,964.88	$1,540,964.88	$521,277.12	$521,277.12	$185,342.98	$94,602.14	$0.00	$0.00	$0.00	$0.00	$0.00	$14,315,366.52
$42,926.00	$42,926.00	$42,926.00	$42,926.00	$33,982.00	$33,514.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$33,020.00	$1,051,267.00
$510,255.90	$510,255.90	$510,255.90	$510,255.90																
$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	$5,174.00	
			$822,472.70	$822,472.70	$822,472.70	$822,472.70	$822,472.70	$822,472.70	$822,472.70										
$10,062.00	$10,062.00	$10,062.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	$6,968.00	
			$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15								
$2,288.00	$2,288.00	$2,288.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	$1,716.00	
				$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38							
$780.00	$780.00	$780.00	$780.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	$572.00	
					$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86						
$806.00	$806.00	$806.00	$806.00	$806.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	$598.00	

$510,255.90	$510,255.90	$510,255.90	$1,514,061.76	$1,064,250.24	$1,127,442.10	$1,127,442.10	$1,127,442.10	$1,127,442.10	$1,127,442.10	$304,969.39	$123,636.24	$63,191.86	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$10,748,343.56
$19,110.00	$19,110.00	$19,110.00	$15,444.00	$15,236.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$15,028.00	$475,253.00
$288,357.30	$288,357.30	$288,357.30	$288,357.30															$0.00	
$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	$1,976.00	
$1,508.00	$1,508.00	$1,508.00	$151,767.00	$151,767.00	$151,767.00	$151,767.00	$151,767.00											$0.00	
$2,132.00	$2,132.00	$2,132.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	$1,040.00	
$312.00	$312.00	$312.00	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	
$286.00	$286.00	$286.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$1,534.00	$32,524.13	$32,524.13						$0.00	
$288,357.30	$288,357.30	$288,357.30	$679,989.74	$424,156.57	$460,746.22	$460,746.22	$460,746.22	$308,979.22	$308,979.22	$308,979.22	$89,113.77	$36,589.64	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$4,672,455.23
$6,214.00	$6,214.00	$6,214.00	$5,148.00	$5,044.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$4,992.00	$155,498.00
$28,170.45	$28,170.45	$28,170.45	$28,170.45															$0.00	
$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	$156.00	
$156.00	$156.00	$156.00	$19,219.32	$19,219.32	$19,219.32	$19,219.32	$19,219.32											$0.00	
$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	$104.00	
$26.00	$26.00	$26.00	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$52.00	$52.00	$52.00	$52.00	$52.00	$52.00	$52.00	$52.00	
$26.00	$26.00	$26.00	$52.00	$52.00	$52.00	$52.00	$52.00	$52.00	$52.00	$52.00	$5,030.84	$5,030.84						$0.00	
$28,170.45	$28,170.45	$28,170.45	$57,451.46	$34,311.85	$39,342.70	$39,342.70	$39,342.70	$39,342.70	$20,123.38	$20,123.38	$10,061.69	$5,030.84	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$417,155.18
$468.00	$468.00	$468.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$364.00	$11,666.00
			$0.00															$0.00	
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00

$375.00	$375.00	$375.00	$375.00	$375.00	$375.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	
							$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97	$5,791.97					
$375.00	$375.00	$375.00	$375.00	$375.00	$375.00	$375.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	
$37,404.48	$37,404.48	$37,404.48	$37,404.48	$73,690.34	$78,034.32	$83,826.29	$89,618.26	$89,618.26	$89,618.26	$89,618.26	$20,271.89	$15,927.91	$11,583.94	$5,791.97	$0.00	$0.00	$0.00	$0.00	$797,217.60
$14,569.00	$14,569.00	$14,569.00	$14,569.00	$21,453.00	$21,804.00	$22,397.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$22,990.00	$436,995.00
$805,404.60	$805,404.60	$805,404.60	$805,404.60																
$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	$108,174.00	
				$1,019,687.76	$1,019,687.76	$1,019,687.76	$1,019,687.76	$1,019,687.76	$1,019,687.76										
$62,175.00	$62,175.00	$62,175.00	$62,175.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	$133,826.00	
				$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14	$335,934.14							
$18,150.00	$18,150.00	$18,150.00	$18,150.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	$42,108.00	
					$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83	$90,740.83						
$4,875.00	$4,875.00	$4,875.00	$4,875.00	$4,875.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	$11,374.00	
						$94,602.14	$94,602.14	$94,602.14	$94,602.14	$94,602.14	$94,602.14	$94,602.14	$94,602.14						
$5,100.00	$5,100.00	$5,100.00	$5,100.00	$5,100.00	$5,100.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	$11,858.00	
$805,404.60	$805,404.60	$805,404.60	$805,404.60	$1,355,621.80	$1,446,362.74	$1,540,964.88	$1,540,964.88	$1,540,964.88	$1,540,964.88	$1,540,964.88	$521,277.12	$521,277.12	$185,342.98	$94,602.14	$0.00	$0.00	$0.00	$0.00	$14,315,366.52
$198,474.00	$198,474.00	$198,474.00	$198,474.00	$294,083.00	$300,582.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$307,340.00	$5,918,735.00
$510,255.90	$510,255.90	$510,255.90	$510,255.90																
$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	$48,158.00	
			$822,472.70	$822,472.70	$822,472.70	$822,472.70	$822,472.70	$822,472.70	$822,472.70	$822,472.70									
$29,025.00	$29,025.00	$29,025.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	$64,856.00	
			$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15	$181,333.15								
$6,600.00	$6,600.00	$6,600.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	$15,972.00	
				$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38	$60,444.38						
$2,250.00	$2,250.00	$2,250.00	$2,250.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	$5,324.00	
					$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86	$63,191.86						
$2,325.00	$2,325.00	$2,325.00	$2,325.00	$2,325.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	$5,566.00	
$510,255.90	$510,255.90	$510,255.90	$1,514,061.76	$1,064,250.24	$1,127,442.10	$1,127,442.10	$1,127,442.10	$1,127,442.10	$1,127,442.10	$1,127,442.10	$304,969.39	$123,636.24	$63,191.86	$0.00	$0.00	$0.00	$0.00	$0.00	$10,748,343.56
$88,358.00	$88,358.00	$88,358.00	$133,561.00	$136,635.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,876.00	$139,878.00	$2,729,656.00
$288,357.30	$288,357.30	$288,357.30	$288,357.30																
$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	$18,392.00	
			$151,767.00	$151,767.00	$151,767.00	$151,767.00	$151,767.00												
$4,350.00	$4,350.00	$4,350.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	$9,680.00	
			$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44	$239,865.44								
$6,150.00	$6,150.00	$6,150.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	$14,278.00	
				$32,524.13	$32,524.13	$32,524.13	$32,524.13	$32,524.13	$32,524.13	$32,524.13	$32,524.13	$32,524.13	$32,524.13						
$900.00	$900.00	$900.00	$900.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	$1,936.00	
					$36,589.64	$36,589.64	$36,589.64	$36,589.64	$36,589.64	$36,589.64	$36,589.64	$36,589.64	$36,589.64						
$825.00	$825.00	$825.00	$825.00	$825.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	$2,178.00	
$288,357.30	$288,357.30	$288,357.30	$679,989.74	$424,156.57	$460,746.22	$460,746.22	$460,746.22	$308,979.22	$308,979.22	$308,979.22	$69,113.77	$36,589.64	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$4,672,455.23
$30,617.00	$30,617.00	$30,617.00	$44,075.00	$45,111.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$46,464.00	$911,566.00
$28,170.45	$28,170.45	$28,170.45	$28,170.45																
$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	$1,452.00	
			$19,219.32	$19,219.32	$19,219.32	$19,219.32	$19,219.32	$19,219.32											
$450.00	$450.00	$450.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	$968.00	
			$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69	$10,061.69								
$300.00	$300.00	$300.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	$484.00	
				$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84							
$75.00	$75.00	$75.00	$75.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	
					$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84	$5,030.84						
$75.00	$75.00	$75.00	$75.00	$75.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	$242.00	
$28,170.45	$28,170.45	$28,170.45	$57,451.46	$34,311.85	$39,342.70	$39,342.70	$39,342.70	$39,342.70	$20,123.38	$20,123.38	$10,061.69	$5,030.84	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$417,155.18
$2,352.00	$2,352.00	$2,352.00	$3,054.00	$3,221.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$3,388.00	$67,207.00
			$0.00																
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
			$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00									
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
				$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00								
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
					$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00							
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
						$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00					
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
							$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00					
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
									$0.00	$0.00	$0.00	$0.00	$0.00	$0.00					
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
										$0.00	$0.00	$0.00	$0.00	$0.00					
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
																			Tot. (eng.)-All Yrs.
$1,730,053.53	$1,730,053.53	$1,730,053.53	$3,154,772.84	$3,015,014.11	$3,218,624.06	$3,323,968.58	$3,334,710.94	$3,182,943.94	$3,163,724.62	$1,321,564.16	$761,687.11	$318,696.83	$116,086.88	$10,742.37	$0.00	$0.00	$0.00	$0.00	$31,745,885.29
$348,939.00	$348,939.00	$348,939.00	$408,302.00	$521,956.00	$533,918.00	$541,862.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$10,501,154.00
$2,078,992.53	$2,078,992.53	$2,078,992.53	$3,563,074.84	$3,536,970.11	$3,752,542.06	$3,865,830.58	$3,877,758.94	$3,725,991.94	$3,706,772.62	$1,864,612.16	$1,304,735.11	$862,744.83	$659,134.88	$553,790.37	$543,048.00	$543,048.00	$543,048.00	$543,048.00	$42,247,039.29


Proposed Amendment Cost ($)
Millions
45
40
35
30
25
20
15
10
5
0
0
10
20
30
40
50
60
70
80
Percentage of Incentive Funding
High End of Total Cost Range
Low End of Total Cost Range
Annual Cost - High End of Range

"Alternative #2" Worksheet

8/10/2006

8/14/2006

Comparison of Diesel vs. Electric Operating Costs

Analysis Assumptions:

1000 Hours/Year Operation
20 Year Amortization Period for Diesel Engine
40 Year Amortization Period for Electric Motor
BE=$1.21 3.1 $/Gallon Diesel Fuel Cost (on-road retail; spreadsheet will delete taxes)
BE=$0.25 0.11 $/Kilowatt-Hour (KwH) Electricity Cost (PG&E AG5B Average)

Diesel Engine HP Category	HP Range Lower Limit	Upper Limit	Equiv. Electric Motor Size (HP)	(kW)	Diesel Engine Cost ($)	Diesel Mtce Cost ($)	Diesel Fuel Cost ($)	Diesel Ann. Capital Cost ($)	Ann. Oper. Cost ($)	Total ($)	Electric Motor Cost	Electric Mtce Cost	Electric Power Cost	Electric Ann. Capital Cost ($)	Ann. Oper. Cost ($)	Total Electric Costs (/year) Total ($)	Motor vs. Electric Differential Alt	Capital Cost Differential	Annual Cost Differential
50-74	50	74	55	41	$11,000.00	$1,110.00	$9,283.15	$882.20	$10,393.15	$11,275.35	$10,417.18	$54.76	$4,493.61	$807.32	$4,548.37	$5,155.69	1.187	1.452607321	2.285029923
75-99	75	99	73	55	$12,700.00	$1,485.00	$12,419.35	$1,016.54	$13,904.35	$14,922.89	$13,524.61	$73.26	$6,011.72	$788.48	$6,084.98	$6,873.46	1.171	1.291788881	2.285029923
100-174	100	174	129	96	$16,600.00	$2,610.00	$21,827.95	$1,331.32	$24,437.95	$25,769.27	$20,351.89	$128.76	$10,566.05	$1,186.52	$10,694.81	$11,881.32	1.169	1.122042193	2.285029923
175-299	175	299	221	165	$23,200.00	$4,485.00	$37,508.95	$1,860.64	$41,993.95	$43,854.59	$38,859.02	$221.26	$18,156.60	$2,253.82	$18,377.86	$20,631.68	1.126	0.825549174	2.285029923
300-599	300	599	443	331	$34,600.00	$8,985.00	$75,143.35	$2,774.92	$84,128.35	$86,903.27	$68,432.24	$443.26	$36,373.92	$3,989.60	$36,817.18	$40,806.78	1.130	0.695538427	2.285029923
600-750	600	750	555	414	$42,400.00	$11,250.00	$94,085.99	$3,400.48	$105,335.99	$108,736.47	$85,683.11	$555.00	$45,543.30	$4,995.33	$46,098.30	$51,093.63	1.128	0.680732437	2.285029923
>750 (1725) *		1725	1277	952	$230,125.00	$25,875.00	$216,397.79	$18,456.03	$242,272.79	$260,728.81	$196,499.93	$1,276.50	$104,749.59	$11,455.95	$106,026.09	$117,482.04	1.219	1.611043277	2.285029923

* Since this category is open-ended, an assumed HP of 1,725 was used. Based on district permit data, this is likely the largest irrigation pump engine in use

Cost Calculations for Alternative #2 (100% Switch to Electric Motors)
(Low End of Range)

Engine Category (Compl. Yr + 1)	# of In-Use Engines	Equivalent Motor Size (kW)	Annual Capital Cost	Annual Mtce/Oper Cost	Initial Air District Fee *	Air District Renewal Fee	2008 Affected Engine Population	Year 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
50 - 74 Hp																							
Statewide Total, Tier 0 (2012)	32	41	$607.32	$4,548.37	$0.00	$0.00	54	$0.00	$0.00	$0.00	$0.00	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99
Statewide Total, Tier 1 (2016)	49	41	$607.32	$4,548.37	$0.00	$0.00	71	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$252,628.68	$252,628.68	$252,628.68	$252,628.68	$252,628.68	$252,628.68	$252,628.68	$252,628.68
Statewide Total, Tier 2 (2016)	3	41	$607.32	$4,548.37	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06
Statewide Total, Tier 2 (2017)	3	41	$607.32	$4,548.37	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06
Statewide Total, Tier 2 (2018)	4	41	$607.32	$4,548.37	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75
Statewide Total, Tier 2 (2019)	4	41	$607.32	$4,548.37	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$0.00	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$433,077.74	$448,544.80	$469,167.55	$489,790.30	$489,790.30	$489,790.30	$489,790.30	$489,790.30
75 - 99 Hp																							
Statewide Total, Tier 0 (2012)	32	55	$788.48	$6,084.98	$0.00	$0.00	54	$0.00	$0.00	$0.00	$0.00	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73
Statewide Total, Tier 1 (2016)	49	55	$788.48	$6,084.98	$0.00	$0.00	71	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55
Statewide Total, Tier 2 (2016)	3	55	$788.48	$6,084.98	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38
Statewide Total, Tier 2 (2017)	3	55	$788.48	$6,084.98	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38
Statewide Total, Tier 2 (2018)	4	55	$788.48	$6,084.98	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84
Statewide Total, Tier 2 (2019)	4	55	$788.48	$6,084.98	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$0.00	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$577,370.67	$597,991.05	$625,484.89	$652,978.73	$652,978.73	$652,978.73	$652,978.73	$652,978.73
100 - 174 Hp																							
Statewide Total, Tier 0 (2011)	447	96	$1,186.52	$10,694.81	$0.00	$0.00	689	$0.00	$0.00	$0.00	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35
Statewide Total, Tier 1 (2016)	553	96	$1,186.52	$10,694.81	$0.00	$0.00	829	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34
Statewide Total, Tier 2 (2016)	174	96	$1,186.52	$10,694.81	$0.00	$0.00	242	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80
Statewide Total, Tier 2 (2017)	47	96	$1,186.52	$10,694.81	$0.00	$0.00	65	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$558,422.07	$558,422.07	$558,422.07	$558,422.07	$558,422.07	$558,422.07	$558,422.07
Statewide Total, Tier 2 (2018)	49	96	$1,186.52	$10,694.81	$0.00	$0.00	68	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$582,184.71	$582,184.71	$582,184.71	$582,184.71	$582,184.71	$582,184.71
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$13,948,670.50	$14,507,092.57	$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28
175 - 299 Hp																							
Statewide Total, Tier 0 (2011)	199	165	$2,253.82	$18,377.86	$0.00	$0.00	310	$0.00	$0.00	$0.00	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63
Statewide Total, Tier 1 (2015)	268	165	$2,253.82	$18,377.86	$0.00	$0.00	387	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5,529,269.31	$5,529,269.31	$5,529,269.31	$5,529,269.31	$5,529,269.31	$5,529,269.31	$5,529,269.31	$5,529,269.31	$5,529,269.31
Statewide Total, Tier 2 (2015)	66	165	$2,253.82	$18,377.86	$0.00	$0.00	88	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65
Statewide Total, Tier 2 (2016)	22	165	$2,253.82	$18,377.86	$0.00	$0.00	30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88
Statewide Total, Tier 2 (2017)	23	165	$2,253.82	$18,377.86	$0.00	$0.00	31	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$474,528.56	$474,528.56	$474,528.56	$474,528.56	$474,528.56	$474,528.56	$474,528.56
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$10,996,663.59	$11,450,580.47	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03
300 - 599 Hp																							
Statewide Total, Tier 0 (2011)	76	331	$3,989.60	$36,817.18	$0.00	$0.00	119	$0.00	$0.00	$0.00	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93
Statewide Total, Tier 1 (2015)	40	331	$3,989.60	$36,817.18	$0.00	$0.00	58	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02
Statewide Total, Tier 2 (2015)	59	331	$3,989.60	$36,817.18	$0.00	$0.00	82	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75
Statewide Total, Tier 2 (2016)	8	331	$3,989.60	$36,817.18	$0.00	$0.00	12	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20
Statewide Total, Tier 2 (2017)	9	331	$3,989.60	$36,817.18	$0.00	$0.00	11	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$367,260.98	$367,260.98	$367,260.98	$367,260.98	$367,260.98	$367,260.98	$367,260.98
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$7,141,185.70	$7,467,639.91	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89
600 - 750 Hp																							
Statewide Total, Tier 0 (2011)	6	414	$4,995.33	$46,098.30	$0.00	$0.00	10	$0.00	$0.00	$0.00	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75
Statewide Total, Tier 1 (2015)	4	414	$4,995.33	$46,098.30	$0.00	$0.00	6	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50
Statewide Total, Tier 2 (2015)	2	414	$4,995.33	$46,098.30	$0.00	$0.00	4	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25
Statewide Total, Tier 2 (2016)	1	414	$4,995.33	$46,098.30	$0.00	$0.00	1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63
Statewide Total, Tier 2 (2017)	1	414	$4,995.33	$46,098.30	$0.00	$0.00	1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$613,123.50	$664,217.13	$715,310.75	$715,310.75	$715,310.75	$715,310.75	$715,310.75	$715,310.75	$715,310.75
Greater Than 750 Hp																							
Statewide Total, Tier 0 (2015)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2015)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2016)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2017)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2018)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2019)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2020)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2021)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2022)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total # Engines:	2244																						
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Ann. Totals- All Cat. (in 2005 $)								$0	$0	$0	$12,824,531	$13,209,463	$13,209,463	$13,209,463	$24,448,876	$34,541,556	$36,028,949	$36,659,250	$36,707,367	$36,707,367	$36,707,367	$36,707,367	$36,707,367

* Includes operator owner cost to complete and submit application; 2hrs. @ $50/hr.

Cost Calculations for Alternative #2 (100% Switch to Electric Motors)
(High End of Range)

Engine Category (Compl. Yr + 1)	# of In-Use Engines	Equivalent Motor Size (kW)	Annual Capital Cost	Annual Mtce/Oper Cost	Initial Air District Fee *	Air District Renewal Fee	Year 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023

50 - 74 Hp																					
Statewide Total, Tier 0 (2012)	32	41	$607.32	$4,548.37	$0.00	$0.00	54	$0.00	$0.00	$0.00	$0.00	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99
Statewide Total, Tier 1 (2016)	49	41	$607.32	$4,548.37	$0.00	$0.00	71	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$252,626.68	$252,626.68	$252,626.68	$252,626.68	$252,626.68	$252,626.68
Statewide Total, Tier 2 (2016)	3	41	$607.32	$4,548.37	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06
Statewide Total, Tier 2 (2017)	3	41	$607.32	$4,548.37	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06
Statewide Total, Tier 2 (2018)	4	41	$607.32	$4,548.37	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,622.75	$20,622.75	$20,622.75	$20,622.75
Statewide Total, Tier 2 (2019)	4	41	$607.32	$4,548.37	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,622.75	$20,622.75	$20,622.75
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$0.00	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$433,077.74	$448,544.80	$469,167.55	$489,790.30	$489,790.30	$489,790.30
75 - 99 Hp																					
Statewide Total, Tier 0 (2012)	32	55	$788.48	$6,084.98	$0.00	$0.00	54	$0.00	$0.00	$0.00	$0.00	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73
Statewide Total, Tier 1 (2016)	49	55	$788.48	$6,084.98	$0.00	$0.00	71	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55
Statewide Total, Tier 2 (2016)	3	55	$788.48	$6,084.98	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38
Statewide Total, Tier 2 (2017)	3	55	$788.48	$6,084.98	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38
Statewide Total, Tier 2 (2018)	4	55	$788.48	$6,084.98	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$27,493.84	$27,493.84	$27,493.84	$27,493.84
Statewide Total, Tier 2 (2019)	4	55	$788.48	$6,084.98	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$27,493.84	$27,493.84	$27,493.84
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$0.00	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$577,370.67	$597,991.05	$625,484.89	$652,978.73	$652,978.73	$652,978.73
100 - 174 Hp																					
Statewide Total, Tier 0 (2011)	447	96	$1,186.52	$10,694.81	$0.00	$0.00	689	$0.00	$0.00	$0.00	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35
Statewide Total, Tier 1 (2016)	553	96	$1,186.52	$10,694.81	$0.00	$0.00	829	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34
Statewide Total, Tier 2 (2016)	174	96	$1,186.52	$10,694.81	$0.00	$0.00	242	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80
Statewide Total, Tier 2 (2017)	47	96	$1,186.52	$10,694.81	$0.00	$0.00	65	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$556,422.07	$556,422.07	$556,422.07	$556,422.07	$556,422.07
Statewide Total, Tier 2 (2018)	49	96	$1,186.52	$10,694.81	$0.00	$0.00	68	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$582,184.71	$582,184.71	$582,184.71	$582,184.71
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$13,948,670.50	$14,507,092.57	$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28
175 - 299 Hp																					
Statewide Total, Tier 0 (2011)	199	165	$2,253.82	$18,377.86	$0.00	$0.00	310	$0.00	$0.00	$0.00	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63
Statewide Total, Tier 1 (2015)	268	165	$2,253.82	$18,377.86	$0.00	$0.00	387	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31
Statewide Total, Tier 2 (2015)	66	165	$2,253.82	$18,377.86	$0.00	$0.00	88	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65
Statewide Total, Tier 2 (2016)	22	165	$2,253.82	$18,377.86	$0.00	$0.00	30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88
Statewide Total, Tier 2 (2017)	23	165	$2,253.82	$18,377.86	$0.00	$0.00	31	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$474,528.56	$474,528.56	$474,528.56	$474,528.56
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$10,996,683.59	$11,450,580.47	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03
300 - 599 Hp																					
Statewide Total, Tier 0 (2011)	76	331	$3,989.60	$36,817.18	$0.00	$0.00	119	$0.00	$0.00	$0.00	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93
Statewide Total, Tier 1 (2015)	40	331	$3,989.60	$36,817.18	$0.00	$0.00	58	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02
Statewide Total, Tier 2 (2015)	59	331	$3,989.60	$36,817.18	$0.00	$0.00	82	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75
Statewide Total, Tier 2 (2016)	8	331	$3,989.60	$36,817.18	$0.00	$0.00	12	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20
Statewide Total, Tier 2 (2017)	9	331	$3,989.60	$36,817.18	$0.00	$0.00	11	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$367,260.98	$367,260.98	$367,260.98	$367,260.98
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$7,141,185.70	$7,467,639.91	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89
600 - 750 Hp																					
Statewide Total, Tier 0 (2011)	8	414	$4,986.33	$46,086.30	$0.00	$0.00	10	$0.00	$0.00	$0.00	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75
Statewide Total, Tier 1 (2015)	4	414	$4,986.33	$46,086.30	$0.00	$0.00	6	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50
Statewide Total, Tier 2 (2015)	2	414	$4,986.33	$46,086.30	$0.00	$0.00	4	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25
Statewide Total, Tier 2 (2016)	1	414	$4,986.33	$46,086.30	$0.00	$0.00	1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63
Statewide Total, Tier 2 (2017)	1	414	$4,986.33	$46,086.30	$0.00	$0.00	1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$51,093.63	$51,093.63	$51,093.63	$51,093.63
Subtotals (in 2005 $)								$0.00	$0.00	$0.00	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$613,123.50	$664,217.13	$715,310.75	$715,310.75	$715,310.75	$715,310.75	$715,310.75
Greater Than 750 Hp																					
Statewide Total, Tier 0 (2015)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2015)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2016)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2016)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2017)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2018)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2019)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2020)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2021)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2022)	0	952	$11,455.95	$106,026.09	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total # Engines:	2244							$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Subtotals (in 2005 $)																					
Ann. Totals- All Cat. (in 2005 $)								$0	$0	$0	$12,824,531	$13,209,463	$13,209,463	$13,209,463	$24,446,876	$34,541,556	$36,028,949	$36,659,250	$36,707,367	$36,707,367	$36,707,367

* Includes operator owner cost to complete and submit application; 2hrs. @ $50/hr.

Cost Calculations for Diesel Engine Replacement Scenario

(Low End of Range)

Engine Category (Compl. Yr + 1)	# of In-Use Engines	Annual Capital Cost	Annual Mtce/Oper Cost	Initial Air District Fee *	Air District Renewal Fee	2008 Affected Engine Population	Year 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
50 - 74 hp																						
Statewide Total, Tier 0 (2012)	32	$882.20	$10,393.15	$0.00	$0.00	54	$0.00	$0.00	$0.00	$0.00	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25
Statewide Total, Tier 1 (2016)	49	$882.20	$10,393.15	$0.00	$0.00	71	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22
Statewide Total, Tier 2 (2016)	3	$882.20	$10,393.15	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05
Statewide Total, Tier 2 (2017)	3	$882.20	$10,393.15	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05
Statewide Total, Tier 2 (2018)	4	$882.20	$10,393.15	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41
Statewide Total, Tier 2 (2019)	4	$882.20	$10,393.15	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41
Subtotals (in 2005 $)							$0.00	$0.00	$0.00	$0.00	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$947,129.53	$980,955.58	$1,026,056.99	$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39
75 - 99 hp																						
Statewide Total, Tier 0 (2012)	32	$1,018.54	$13,904.35	$0.00	$0.00	54	$0.00	$0.00	$0.00	$0.00	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52
Statewide Total, Tier 1 (2016)	49	$1,018.54	$13,904.35	$0.00	$0.00	71	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68
Statewide Total, Tier 2 (2016)	3	$1,018.54	$13,904.35	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67
Statewide Total, Tier 2 (2017)	3	$1,018.54	$13,904.35	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67
Statewide Total, Tier 2 (2018)	4	$1,018.54	$13,904.35	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57
Statewide Total, Tier 2 (2019)	4	$1,018.54	$13,904.35	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57
Subtotals (in 2005 $)							$0.00	$0.00	$0.00	$0.00	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$1,253,522.87	$1,298,291.55	$1,357,983.11	$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68
100 - 174 hp																						
Statewide Total, Tier 0 (2011)	447	$1,331.32	$24,437.95	$0.00	$0.00	689	$0.00	$0.00	$0.00	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06
Statewide Total, Tier 1 (2016)	553	$1,331.32	$24,437.95	$0.00	$0.00	829	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76
Statewide Total, Tier 2 (2016)	174	$1,331.32	$24,437.95	$0.00	$0.00	242	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12
Statewide Total, Tier 2 (2017)	47	$1,331.32	$24,437.95	$0.00	$0.00	65	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73
Statewide Total, Tier 2 (2018)	49	$1,331.32	$24,437.95	$0.00	$0.00	68	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27
Subtotals (in 2005 $)							$0.00	$0.00	$0.00	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$30,253,123.94	$31,464,279.67	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94
175 - 299 hp																						
Statewide Total, Tier 0 (2011)	199	$1,860.64	$41,993.95	$0.00	$0.00	310	$0.00	$0.00	$0.00	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40
Statewide Total, Tier 1 (2015)	268	$1,860.64	$41,993.95	$0.00	$0.00	387	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11
Statewide Total, Tier 2 (2015)	66	$1,860.64	$41,993.95	$0.00	$0.00	88	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94
Statewide Total, Tier 2 (2016)	22	$1,860.64	$41,993.95	$0.00	$0.00	30	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98
Statewide Total, Tier 2 (2017)	23	$1,860.64	$41,993.95	$0.00	$0.00	31	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57
Subtotals (in 2005 $)							$0.00	$0.00	$0.00	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$23,374,496.45	$24,339,297.43	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00

300 - 599 hp																					
Statewide Total, Tier 0 (2011)	76	$2,774.92	$84,128.35	$0.00	$0.00	119	$0.00	$0.00	$0.00	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36
Statewide Total, Tier 1 (2015)	40	$2,774.92	$84,128.35	$0.00	$0.00	58	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72
Statewide Total, Tier 2 (2015)	59	$2,774.92	$84,128.35	$0.00	$0.00	82	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81
Statewide Total, Tier 2 (2016)	8	$2,774.92	$84,128.35	$0.00	$0.00	12	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14
Statewide Total, Tier 2 (2017)	9	$2,774.92	$84,128.35	$0.00	$0.00	11	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41
Subtotals (in 2005 $)							$0.00	$0.00	$0.00	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$15,206,071.89	$15,903,298.03	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44
600 - 750 hp																					
Statewide Total, Tier 0 (2011)	6	$3,400.48	$105,335.99	$0.00	$0.00	10	$0.00	$0.00	$0.00	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85
Statewide Total, Tier 1 (2015)	4	$3,400.48	$105,335.99	$0.00	$0.00	6	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90
Statewide Total, Tier 2 (2015)	2	$3,400.48	$105,335.99	$0.00	$0.00	4	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95
Statewide Total, Tier 2 (2016)	1	$3,400.48	$105,335.99	$0.00	$0.00	1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47
Statewide Total, Tier 2 (2017)	1	$3,400.48	$105,335.99	$0.00	$0.00	1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47
Subtotals (in 2005 $)							$0.00	$0.00	$0.00	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$1,304,837.70	$1,413,574.17	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65
Greater Than 750 hp																					
Statewide Total, Tier 0 (2015)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2015)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2016)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2017)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2018)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2019)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2020)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2021)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2022)	0	$18,456.03	$242,272.79	$0.00	$0.00	0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Total # Engines:	2244																				
Subtotals (in 2005 $)							$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Ann. Totals- All Cat (in 2005 $)							$0	$0	$0	$27,502,995	$28,341,338	$28,341,338	$28,341,338	$52,244,614	$74,109,946	$77,299,218	$78,666,705	$78,771,496	$78,771,496	$78,771,496	$78,771,496

* Includes operator owner cost to complete and submit application; 2hrs. @ $50/hr.

Cost Calculations for Diesel Engine Replacement Scenario
(High End of Range)

Engine Category (Compl. Yr +1)	# of In-Use Engines	Annual Capital Cost	Annual Mtce/Oper Cost	Initial Air District Fee*	Air District Renewal Fee	2008 Affected Engine Population	Year 2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
50 - 74 hp																						
Statewide Total, Tier 0 (2012)	32	$882.20	$10,393.15	$0.00	$0.00	54	$0.00	$0.00	$0.00	$0.00	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25
Statewide Total, Tier 1 (2016)	49	$882.20	$10,393.15	$0.00	$0.00	71	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22
Statewide Total, Tier 2 (2016)	3	$882.20	$10,393.15	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05
Statewide Total, Tier 2 (2017)	3	$882.20	$10,393.15	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41
Statewide Total, Tier 2 (2018)	4	$882.20	$10,393.15	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41
Statewide Total, Tier 2 (2019)	4	$882.20	$10,393.15	$0.00	$0.00	5	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$45,101.41	$45,101.41	$45,101.41	$45,101.41
Subtotals (in 2005 $)							$0.00	$0.00	$0.00	$0.00	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$947,129.53	$960,955.58	$1,026,056.99	$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39
75 - 99 hp																						
Statewide Total, Tier 0 (2012)	32	$1,018.54	$13,904.35	$0.00	$0.00	54					$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52
Statewide Total, Tier 1 (2016)	49	$1,018.54	$13,904.35	$0.00	$0.00	71									$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68
Statewide Total, Tier 2 (2016)	3	$1,018.54	$13,904.35	$0.00	$0.00	5									$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67
Statewide Total, Tier 2 (2017)	3	$1,018.54	$13,904.35	$0.00	$0.00	5										$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67
Statewide Total, Tier 2 (2018)	4	$1,018.54	$13,904.35	$0.00	$0.00	5											$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57
Statewide Total, Tier 2 (2019)	4	$1,018.54	$13,904.35	$0.00	$0.00	5												$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57
Subtotals (in 2005 $)											$477,532.52	$477,532.52	$477,532.52	$477,532.52	$1,253,522.87	$1,296,291.55	$1,357,983.11	$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68
100 - 174 hp																						
Statewide Total, Tier 0 (2011)	447	$1,331.32	$24,437.95	$0.00	$0.00	689				$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06
Statewide Total, Tier 1 (2016)	553	$1,331.32	$24,437.95	$0.00	$0.00	829									$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76
Statewide Total, Tier 2 (2016)	174	$1,331.32	$24,437.95	$0.00	$0.00	242									$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12
Statewide Total, Tier 2 (2017)	47	$1,331.32	$24,437.95	$0.00	$0.00	65										$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73
Statewide Total, Tier 2 (2018)	49	$1,331.32	$24,437.95	$0.00	$0.00	68											$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27
Subtotals (in 2005 $)										$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$30,253,123.94	$31,464,279.67	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94
175 - 299 hp																						
Statewide Total, Tier 0 (2011)	199	$1,860.64	$41,993.95	$0.00	$0.00	310				$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40
Statewide Total, Tier 1 (2015)	268	$1,860.64	$41,993.95	$0.00	$0.00	387								$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11
Statewide Total, Tier 2 (2015)	66	$1,860.64	$41,993.95	$0.00	$0.00	88								$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94
Statewide Total, Tier 2 (2016)	22	$1,860.64	$41,993.95	$0.00	$0.00	30									$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98
Statewide Total, Tier 2 (2017)	23	$1,860.64	$41,993.95	$0.00	$0.00	31										$1,006,655.57	$1,006,655.57	$1,006,655.57	$1,006,655.57	$1,006,655.57	$1,006,655.57	$1,006,655.57
Subtotals (in 2005 $)										$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$23,374,496.45	$24,339,297.43	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00
300 - 599 hp																						
Statewide Total, Tier 0 (2011)	76	$2,774.92	$84,128.35	$0.00	$0.00	119				$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36
Statewide Total, Tier 1 (2015)	40	$2,774.92	$84,128.35	$0.00	$0.00	58								$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72
Statewide Total, Tier 2 (2015)	59	$2,774.92	$84,128.35	$0.00	$0.00	82								$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81
Statewide Total, Tier 2 (2016)	8	$2,774.92	$84,128.35	$0.00	$0.00	12									$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14
Statewide Total, Tier 2 (2017)	9	$2,774.92	$84,128.35	$0.00	$0.00	11										$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41
Subtotals (in 2005 $)										$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$15,206,071.89	$15,903,298.03	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44
600 - 750 hp																						
Statewide Total, Tier 0 (2011)	6	$3,400.48	$105,335.99	$0.00	$0.00	10				$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85
Statewide Total, Tier 1 (2015)	4	$3,400.48	$105,335.99	$0.00	$0.00	6								$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90
Statewide Total, Tier 2 (2015)	2	$3,400.48	$105,335.99	$0.00	$0.00	4								$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95
Statewide Total, Tier 2 (2016)	1	$3,400.48	$105,335.99	$0.00	$0.00	1									$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47
Statewide Total, Tier 2 (2017)	1	$3,400.48	$105,335.99	$0.00	$0.00	1										$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47
Subtotals (in 2005 $)										$652,418.85	$652,418.85	$652,418.85	$652,418.85	$1,304,837.70	$1,413,574.17	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65
Greater Than 750 hp																						
Statewide Total, Tier 0 (2015)	0	$18,456.03	$242,272.79	$0.00	$0.00	0								$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2015)	0	$18,456.03	$242,272.79	$0.00	$0.00	0								$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2016)	0	$18,456.03	$242,272.79	$0.00	$0.00	0									$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 1 (2017)	0	$18,456.03	$242,272.79	$0.00	$0.00	0										$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2018)	0	$18,456.03	$242,272.79	$0.00	$0.00	0											$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2019)	0	$18,456.03	$242,272.79	$0.00	$0.00	0												$0.00	$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2020)	0	$18,456.03	$242,272.79	$0.00	$0.00	0													$0.00	$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2021)	0	$18,456.03	$242,272.79	$0.00	$0.00	0														$0.00	$0.00	$0.00
Statewide Total, Tier 2 (2022)	0	$18,456.03	$242,272.79	$0.00	$0.00	0															$0.00	$0.00
Total # Engines:	2244																					
Subtotals (in 2005 $)														$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Ann. Totals- All Cat (in 2005 $)										$27,502,995	$28,341,338	$28,341,338	$28,341,338	$52,244,614	$74,109,946	$77,299,218	$78,666,705	$78,771,496	$78,771,496	$78,771,496	$78,771,496	$78,771,496

* Includes operator owner cost to complete and submit application; 2hrs. @ $50/hr.

2024	2025	2026	2027	2028	2029
$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99
$252,628.68	$252,628.68	$252,628.68	$252,628.68	$252,628.68	$252,628.68
$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06
$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06
$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75
$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75
$489,790.30	$489,790.30	$489,790.30	$489,790.30	$489,790.30	$489,790.30
$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73
$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55
$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38
$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38
$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84
$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84
$652,978.73	$652,978.73	$652,978.73	$652,978.73	$652,978.73	$652,978.73
$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35
$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34
$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80
$558,422.07	$558,422.07	$558,422.07	$558,422.07	$558,422.07	$558,422.07
$582,184.71	$582,184.71	$582,184.71	$582,184.71	$582,184.71	$582,184.71
$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28
$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63
$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31
$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65
$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88
$474,528.56	$474,528.56	$474,528.56	$474,528.56	$474,528.56	$474,528.56
$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03
$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93
$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02
$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75
$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20
$367,260.98	$367,260.98	$367,260.98	$367,260.98	$367,260.98	$367,260.98
$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89
$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75
$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50
$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25
$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63
$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63
$715,310.75	$715,310.75	$715,310.75	$715,310.75	$715,310.75	$715,310.75
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$36,707,367	$36,707,367	$36,707,367	$36,707,367	$36,707,367	$36,707,367
				Total:	$587,810,589

2024	2025	2026	2027	2028	2029

$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99	$164,981.99
$252,628.68	$252,628.68	$252,628.68	$252,628.68	$252,628.68	$252,628.68
$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06
$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06	$15,467.06
$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75
$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75	$20,622.75
$489,790.30	$489,790.30	$489,790.30	$489,790.30	$489,790.30	$489,790.30
$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73	$219,950.73
$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55	$336,799.55
$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38
$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38	$20,620.38
$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84
$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84	$27,493.84
$652,978.73	$652,978.73	$652,978.73	$652,978.73	$652,978.73	$652,978.73
$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35	$5,310,950.35
$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34	$6,570,370.34
$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80	$2,067,349.80
$558,422.07	$558,422.07	$558,422.07	$558,422.07	$558,422.07	$558,422.07
$582,184.71	$582,184.71	$582,184.71	$582,184.71	$582,184.71	$582,184.71
$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28	$15,089,277.28
$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63	$4,105,703.63
$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31	$5,529,289.31
$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65	$1,361,690.65
$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88	$453,896.88
$474,528.56	$474,528.56	$474,528.56	$474,528.56	$474,528.56	$474,528.56
$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03	$11,925,109.03
$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93	$3,101,314.93
$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02	$1,632,271.02
$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75	$2,407,599.75
$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20	$326,454.20
$367,260.98	$367,260.98	$367,260.98	$367,260.98	$367,260.98	$367,260.98
$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89	$7,834,900.89
$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75	$306,561.75
$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50	$204,374.50
$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25	$102,187.25
$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63
$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63	$51,093.63
$715,310.75	$715,310.75	$715,310.75	$715,310.75	$715,310.75	$715,310.75
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$36,707,367	$36,707,367	$36,707,367	$36,707,367	$36,707,367	$36,707,367
				Total:	$587,910,589

2024	2025	2026	2027	2028	2029
$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25
$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22
$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05
$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05
$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41
$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41
$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39
$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52
$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68
$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67
$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67
$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57
$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57
$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68
$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06
$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76
$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12
$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73
$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27
$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94
$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40
$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11
$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94
$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98	$964,800.98
$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57
$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00

$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36
$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72
$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81
$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14
$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41
$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44
$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85
$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90
$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95
$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47
$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47
$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$78,771,498	$78,771,498	$78,771,498	$78,771,498	$78,771,498	$78,771,498
				Total:	$1,261,333,972

2024	2025	2026	2027	2028	2029
$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25	$360,811.25
$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22	$552,492.22
$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05
$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05	$33,826.05
$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41
$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41	$45,101.41
$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39	$1,071,158.39
$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52	$477,532.52
$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68	$731,221.68
$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67
$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67	$44,768.67
$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57
$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57	$59,691.57
$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68	$1,417,674.68
$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06	$11,518,864.06
$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76	$14,250,406.76
$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12	$4,483,853.12
$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73	$1,211,155.73
$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27	$1,262,694.27
$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94	$32,726,973.94
$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40	$8,727,063.40
$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11	$11,753,030.11
$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94	$2,894,402.94
$964,800.96	$964,800.96	$964,800.96	$964,800.96	$964,800.96	$964,800.96
$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57	$1,008,655.57
$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00	$25,347,953.00
$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36	$6,604,648.36
$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72	$3,476,130.72
$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81	$5,127,292.81
$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14	$695,226.14
$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41	$782,129.41
$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44	$16,685,427.44
$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85	$652,418.85
$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90	$434,945.90
$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95	$217,472.95
$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47
$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47	$108,736.47
$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65	$1,522,310.65
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
$78,771,498	$78,771,498	$78,771,498	$78,771,498	$78,771,498	$78,771,498
				Total:	$1,261,333,972

"Cost Effectiveness" Worksheet

9/5/2006

NOTE: Emission reductions are from PTSD 8/15/06 report and are for all air districts except San Joaquin Valley and South Coast (SJV & SC deleted)

This worksheet calculates the cost-effectiveness figures for the following scenarios (reporting basis):

1) PM cost-effectiveness, using loss-of-use engine costs only (for comparison to the cost-effectiveness of other ATCMs) (annual, for analysis period)
2) PM + NO_x Cost-Effectiveness, where 50 percent of loss-of-use engine cost is divided by each of the PM + NO_x emission reductions to arrive at a cost-effectiveness figure for each pollutant (annual, for analysis period)
3) Overall cost-effectiveness, where both engine loss-of-use and air district fees are summed and divided by the PM reductions attributable to the proposed amendments (annual, for analysis period; overall)

NOT USED **NOT USED** **NOT USED**

1) For DPM (use for comparison to other ATCMs):
Does not include local air district fees and owner/operator application prep & submittal time allowance.

Year	Emission Benefits [a] (tpd)	Not Used	Loss-of-Use Engine Costs [c] (2005 $)	Cost Effectiveness (2005 $/lb.)		DPM Reduced (lbs./yr.)	
2011	0.25664	1	$1,632,188	$8.71		187,347	
2012	0.24815	1	$1,730,054	$9.55		181,150	
2013	0.22521	1	$1,730,054	$10.52		164,403	
2014	0.20246	1	$1,730,054	$11.71		147,796	
2015	0.24459	1	$3,154,773	$17.67		178,551	
2016	0.34055	1	$3,015,014	$12.13		**248,602**	**High**
2017	0.32251	1	$3,218,624	$13.67		235,432	
2018	0.30215	1	$3,323,969	$15.07		220,570	
2019	0.27918	1	$3,334,711	$16.36		203,801	
2020	0.25445	1	$3,182,944	$17.14		185,749	
2021	0.22779	1	$3,163,725	**$19.03**	**High**	166,287	
2022	0.2024	1	$1,321,564	$8.94		147,752	
2023	0.17936	1	$761,687	$5.82		130,933	
2024	0.1588	1	$319,697	$2.76		115,924	
2025	0.14095	1	$116,087	$1.13		102,894	
2026	0.12448	1	$10,742	**$0.12**	**Low**	**90,870**	**Low**
2027	0.10978	1	- [b]	- [b]		80,139	
2028	0.09696	1	- [b]	- [b]		70,781	
2029	0.08572	1	- [b]	- [b]		62,576	
Total	4.00213					2,921,555	Reduction

[a] from ARB PTSD 8/15/2006 report
[b] cost effectiveness not calculated for this year due to zero loss-of-use engine costs

2) For DPM & NOx:

For DPM:

Year	Emission Benefits (tpd)	Not Used	Low End of Range Loss-of-Use & Fee Costs (2005 $)	Low End of Range Cost Effectiveness (2005 $/lb.)	High End of Range Loss-of-Use & Fee Costs (2005 $)	High End of Range Cost Effectiveness (2005 $/lb.)
2011	0.25664	1	$854,223	$4.56	$986,870	$5.27
2012	0.24815	1	$902,584	$4.98	$1,039,496	$5.74
2013	0.22521	1	$902,584	$5.49	$1,039,496	$6.32
2014	0.20246	1	$902,584	$6.11	$1,039,496	$7.03
2015	0.24459	1	$1,612,525	$9.03	$1,781,537	$9.98
2016	0.34055	1	$1,537,394	$6.18	$1,768,485	$7.11
2017	0.32251	1	$1,638,783	$6.96	$1,876,271	$7.97
2018	0.30215	1	$1,691,182	$7.67	$1,932,915	$8.76
2019	0.27918	1	$1,696,527	$8.32	$1,938,879	$9.51
2020	0.25445	1	$1,620,644	$8.72	$1,862,996	$10.03
2021	0.22779	1	$1,611,034	$9.69	$1,853,386	**$11.15**
2022	0.20240	1	$689,954	$4.67	$932,306	$6.31
2023	0.17936	1	$410,016	$3.13	$652,368	$4.98
2024	0.15880	1	$189,020	$1.63	$431,372	$3.72
2025	0.14095	1	$87,215	$0.85	$329,567	$3.20
2026	0.12448	1	$34,543	$0.38	$276,895	$3.05

For NOx:

Year	Emission Benefits (tpd)	Not Used	Low End of Range Loss-of-Use Engine Costs (2005 $)	Low End of Range Cost Effectiveness (2005 $/lb.)	High End of Range Loss-of-Use Engine Costs (2005 $)	High End of Range Cost Effectiveness (2005 $/lb.)
2011	4.39639	1	$854,223	$0.2662	$986,870	$0.31
2012	4.21205	1	$902,584	$0.2935	$1,039,496	$0.34
2013	3.85754	1	$902,584	$0.3205	$1,039,496	$0.37
2014	3.51092	1	$902,584	$0.3522	$1,039,496	$0.41
2015	4.34782	1	$1,612,525	$0.5081	$1,781,537	$0.56
2016	5.61729	1	$1,537,394	$0.3749	$1,768,485	$0.43
2017	5.34573	1	$1,638,783	$0.4199	$1,876,271	$0.48
2018	5.03513	1	$1,691,182	$0.4601	$1,932,915	$0.53
2019	4.69737	1	$1,696,527	$0.4947	$1,938,879	$0.57
2020	4.25861	1	$1,620,644	$0.5213	$1,862,996	$0.60
2021	3.80522	1	$1,611,034	$0.5800	$1,853,386	**$0.67**
2022	3.37838	1	$689,954	$0.2798	$932,306	$0.38
2023	2.98789	1	$410,016	$0.1880	$652,368	$0.30
2024	2.64261	1	$189,020	$0.0980	$431,372	$0.22
2025	2.34319	1	$87,215	$0.0510	$329,567	$0.19
2026	2.06553	1	$34,543	$0.0229	$276,895	$0.18

2027	0.10978	1	$29,172	**$0.36**	$271,524	$3.39
2028	0.09696	1	$29,172	$0.41	$271,524	$3.84
2029	0.08572	1	$29,172	$0.47	$271,524	$4.34
Total:	4.00213	Avg.:		$6 /lb. DPM		

[b] cost effectiveness not calculated for this year due to zero loss-of-use engine costs

2027	1.81746	1	$29,172	**$0.0220**	$271,524	$0.20
2028	1.60027	1	$29,172	$0.0250	$271,524	$0.23
2029	1.40811	1	$29,172	$0.0284	$271,524	$0.26
Total:	67.33	Avg.:		$0.33 /lb. Nox		

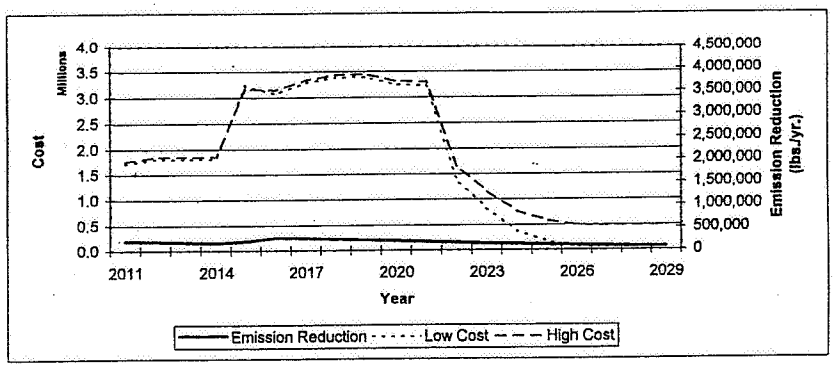
[b] cost effectiveness not calculated for this year due to zero loss-of-use engine costs

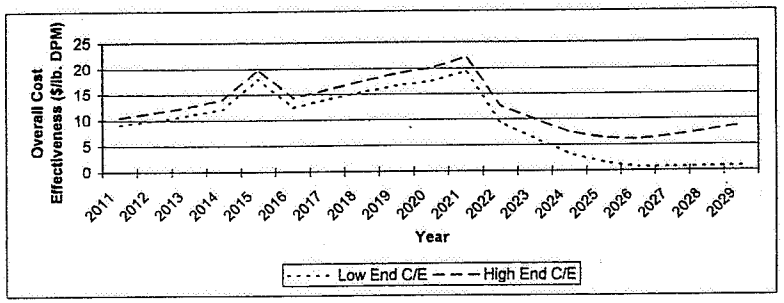
3) Overall Cost Effectiveness for DPM

Year	Emission Benefits[a] (tpd)	Not Used	Emission Benefits (lbs./year)	Low End of Range Loss-of-Use & Fee Costs (2005 $)	Low End of Range Cost Effectiveness (2005 $/lb.)	High End of Range Loss-of-Use & Fee Costs (2005 $)	High End of Range Cost Effectiveness (2005 $/lb.)
2008			0	$487,780		$633,270	
2009			0	$87,464		$249,975	
2010			0	$87,464		$249,975	
2011	0.25664	1	187,347	$1,708,446	$9.12	$1,973,739	$10.54
2012	0.24815	1	181,150	$1,805,168	$9.97	$2,078,993	$11.48
2013	0.22521	1	164,403	$1,805,168	$10.98	$2,078,993	$12.65
2014	0.20246	1	147,796	$1,805,168	$12.21	$2,078,993	$14.07
2015	0.24459	1	178,551	$3,225,051	$18.06	$3,563,075	$19.96
2016	0.34055	1	**248,602**	$3,074,788	$12.37	$3,536,970	$14.23
2017	0.32251	1	235,432	$3,277,566	$13.92	$3,752,542	$15.94
2018	0.30215	1	220,570	$3,382,365	$15.33	$3,865,831	$17.53
2019	0.27918	1	203,801	$3,393,055	$16.65	$3,877,759	$19.03
2020	0.25445	1	185,749	$3,241,288	$17.45	$3,725,992	$20.06
2021	0.22779	1	166,287	$3,222,069	$19.38	$3,706,773	**$22.29**
2022	0.20240	1	147,752	$1,379,908	$9.34	$1,864,612	$12.62
2023	0.17936	1	130,933	$820,031	$6.26	$1,304,735	$9.96
2024	0.15880	1	115,924	$378,041	$3.26	$862,745	$7.44
2025	0.14095	1	102,894	$174,431	$1.70	$659,135	$6.41
2026	0.12448	1	90,870	$69,086	$0.76	$553,790	$6.09
2027	0.10978	1	80,139	$58,344	**$0.73**	$543,048	$6.78
2028	0.09696	1	70,781	$58,344	$0.82	$543,048	$7.67
2029	0.08572	1	**62,576**	$58,344	$0.93	$543,048	$8.68
Overall	**4.00**	1	**2,921,555**	**$33,599,367**		**$42,247,039**	

Average C/E: $11.12 /lb. DPM (for period from 2011 to 2029)

[a] from ARB PTSD 8/15/2006 report





4) Cost Effectiveness Calculation for Alternative #2

For Alternative #2 (100% Replacement w/ Electric Motors):

For PM:

Note: In this example, annual costs include capital, maintenance, & operation.
Assumed 96 percent reduction in emissions for this scenario.

Year	Baseline Emissions (tpd)	Adj. Em. Red. (tpd)	Low End of Range - Annual Cost (2005 $)	High End of Range - Annual Cost (2005 $)	Low End of Range - Cost Effectiveness (2005 $/lb.)	High End of Range - Cost Effectiveness (2005 $/lb.)
2011	1.307083	1.254799	$12,824,531	$12,824,531	**$14.00**	$14.00
2012	1.267662	1.216955	$13,209,463	$13,209,463	$14.87	$14.87
2013	1.226530	1.177469	$13,209,463	$13,209,463	$15.37	$15.37
2014	1.183932	1.136575	$13,209,463	$13,209,463	$15.92	$15.92
2015	1.140861	1.095227	$24,446,876	$24,446,876	$30.58	$30.58
2016	1.099738	1.055748	$34,541,556	$34,541,556	$44.82	$44.82
2017	1.060355	1.017941	$36,028,949	$36,028,949	$48.48	$48.48
2018	1.019006	0.978246	$36,659,250	$36,659,250	$51.33	$51.33
2019	0.975904	0.936868	$36,707,367	$36,707,367	$53.67	$53.67
2020	0.928595	0.891451	$36,707,367	$36,707,367	$56.41	$56.41
2021	0.877051	0.841969	$36,707,367	$36,707,367	$59.72	$59.72
2022	0.827918	0.794801	$36,707,367	$36,707,367	$63.27	$63.27
2023	0.783684	0.752337	$36,707,367	$36,707,367	$66.84	$66.84
2024	0.744623	0.714838	$36,707,367	$36,707,367	$70.34	$70.34
2025	0.711195	0.682748	$36,707,367	$36,707,367	$73.65	$73.65
2026	0.680175	0.652968	$36,707,367	$36,707,367	$77.01	$77.01
2027	0.652192	0.626104	$36,707,367	$36,707,367	$80.31	$80.31
2028	0.626865	0.601790	$36,707,367	$36,707,367	$83.56	$83.56
2029	0.603611	0.579467	$36,707,367	$36,707,367	$86.78	**$86.78**

"Per-Engine Costs" worksheet

8/31/2006

This worksheet calculates the per-engine costs for each affected engine size (hp) category and subcategory (emission level tier.)

High/Low values per group are in **bold**.

Loss of Use & Air District Fees	Loss of Use			Range of Air District Fees*				Loss of Use Plus Air District Fees					
				Initial		Annual (renewal)		One-Time Cost Plus Initial District Fees		Annualized Cost Plus Initial District Fees		Annualized Cost Plus Annual District Fees	
Engine HP/Tier Category (year)**	One-Time Cost	Annualized Cost	Amort. Period (yrs)	Low	High	Low	High	Low	High	Low	High	Low	High
50 - 74 hp													
Tier 0 (2012)	**$6,700**	**$1,889**	4	$145	$190	$26	$242	**$6,845**	**$6,890**	**$2,034**	**$2,079**	**$1,915**	**$2,131**
Tier 1 (2016)	$7,000	**$1,210**	7	$145	$190	$26	$242	$7,145	$7,190	**$1,355**	**$1,400**	**$1,236**	**$1,452**
Tier 2 (2016)	$8,000	$1,238	8	$145	$190	$26	$242	$8,145	$8,190	$1,383	$1,428	$1,264	$1,480
Tier 2 (2017)	$8,000	$1,238	8	$145	$190	$26	$242	$8,145	$8,190	$1,383	$1,428	$1,264	$1,480
Tier 2 (2018)	$8,000	$1,238	8	$145	$190	$26	$242	$8,145	$8,190	$1,383	$1,428	$1,264	$1,480
Tier 2 (2019)	**$8,000**	$1,238	8	$145	$190	$26	$242	**$8,145**	**$8,190**	$1,383	$1,428	$1,264	$1,480
75 - 99 hp													
Tier 0 (2012)	**$4,145**	**$1,169**	4	$145	$190	$26	$242	**$4,290**	**$4,335**	**$1,314**	**$1,359**	**$1,195**	**$1,411**
Tier 1 (2016)	$8,190	$1,415	7	$145	$190	$26	$242	$8,335	$8,380	$1,560	$1,605	$1,441	$1,657
Tier 2 (2016)	$9,360	$1,448	8	$145	$190	$26	$242	$9,505	$9,550	$1,593	$1,638	$1,474	$1,690
Tier 2 (2017)	$9,360	$1,448	8	$145	$190	$26	$242	$9,505	$9,550	$1,593	$1,638	$1,474	$1,690
Tier 2 (2018)	$9,360	$1,448	8	$145	$190	$26	$242	$9,505	$9,550	$1,593	$1,638	$1,474	$1,690
Tier 2 (2019)	**$9,360**	**$1,448**	8	$145	$190	$26	$242	**$9,505**	**$9,550**	**$1,593**	**$1,638**	**$1,474**	**$1,690**
100 - 174 hp													
Tier 0 (2011)	**$7,800**	**$1,802**	5	$145	$190	$26	$242	**$7,945**	**$7,990**	**$1,947**	**$1,992**	**$1,828**	**$2,044**
Tier 1 (2016)	$9,360	$1,844	6	$145	$190	$26	$242	$9,505	$9,550	$1,989	$2,034	$1,870	$2,086
Tier 2 (2016)	$12,480	$1,931	8	$145	$190	$26	$242	$12,625	$12,670	$2,076	$2,121	$1,957	$2,173
Tier 2 (2017)	$12,480	$1,931	8	$145	$190	$26	$242	$12,625	$12,670	$2,076	$2,121	$1,957	$2,173
Tier 2 (2018)	**$12,480**	**$1,931**	8	$145	$190	$26	$242	**$12,625**	**$12,670**	**$2,076**	**$2,121**	**$1,957**	**$2,173**
175 - 299 hp													
Tier 0 (2011)	**$11,100**	**$2,564**	5	$145	$190	$26	$242	**$11,245**	**$11,290**	**$2,709**	**$2,754**	**$2,590**	**$2,806**
Tier 1 (2015)	$17,760	**$3,069**	7	$145	$190	$26	$242	$17,905	$17,950	**$3,214**	**$3,259**	**$3,095**	**$3,311**
Tier 2 (2015)	$17,760	$2,747	8	$145	$190	$26	$242	$17,905	$17,950	$2,892	$2,937	$2,773	$2,989
Tier 2 (2016)	$17,760	$2,747	8	$145	$190	$26	$242	$17,905	$17,950	$2,892	$2,937	$2,773	$2,989
Tier 2 (2017)	**$17,760**	$2,747	8	$145	$190	$26	$242	**$17,905**	**$17,950**	$2,892	$2,937	$2,773	$2,989
300 - 599 hp													
Tier 0 (2011)	**$16,425**	**$3,794**	5	$145	$190	$26	$242	**$16,570**	**$16,615**	**$3,939**	**$3,984**	**$3,820**	**$4,036**
Tier 1 (2015)	$16,425	$3,794	5	$145	$190	$26	$242	$16,570	$16,615	$3,939	$3,984	$3,820	$4,036
Tier 2 (2015)	$26,280	$4,066	8	$145	$190	$26	$242	$26,425	$26,470	$4,211	$4,256	$4,092	$4,308
Tier 2 (2016)	$26,280	$4,066	8	$145	$190	$26	$242	$26,425	$26,470	$4,211	$4,256	$4,092	$4,308
Tier 2 (2017)	**$26,280**	**$4,066**	8	$145	$190	$26	$242	**$26,425**	**$26,470**	**$4,211**	**$4,256**	**$4,092**	**$4,308**
600 - 750 hp													
Tier 0 (2011)	**$20,325**	**$4,695**	5	$145	$190	$26	$242	**$20,470**	**$20,515**	**$4,840**	**$4,885**	**$4,721**	**$4,937**
Tier 1 (2015)	$24,390	$4,805	6	$145	$190	$26	$242	$24,535	$24,580	$4,950	$4,995	$4,831	$5,047
Tier 2 (2015)	$32,520	$5,031	8	$145	$190	$26	$242	$32,665	$32,710	$5,176	$5,221	$5,057	$5,273
Tier 2 (2016)	$32,520	$5,031	8	$145	$190	$26	$242	$32,665	$32,710	$5,176	$5,221	$5,057	$5,273
Tier 2 (2017)	**$32,520**	**$5,031**	8	$145	$190	$26	$242	**$32,665**	**$32,710**	**$5,176**	**$5,221**	**$5,057**	**$5,273**
Greater Than 750 hp													
Tier 0 (2015)	**$21,506**	**$21,506**	1	$145	$190	$26	$242	**$21,651**	**$21,696**	**$21,651**	**$21,696**	**$21,532**	**$21,748**
Tier 1 (2015)	$172,050	$26,616	8	$145	$190	$26	$242	$172,195	$172,240	$26,761	$26,806	$26,642	$26,858
Tier 1 (2016)	$172,050	$26,616	8	$145	$190	$26	$242	$172,195	$172,240	$26,761	$26,806	$26,642	$26,858
Tier 1 (2017)	$172,050	$26,616	8	$145	$190	$26	$242	$172,195	$172,240	$26,761	$26,806	$26,642	$26,858
Tier 2 (2018)	$172,050	$26,616	8	$145	$190	$26	$242	$172,195	$172,240	$26,761	$26,806	$26,642	$26,858
Tier 2 (2019)	$172,050	$26,616	8	$145	$190	$26	$242	$172,195	$172,240	$26,761	$26,806	$26,642	$26,858
Tier 2 (2020)	$172,050	$26,616	8	$145	$190	$26	$242	$172,195	$172,240	$26,761	$26,806	$26,642	$26,858
Tier 2 (2021)	$172,050	$26,616	8	$145	$190	$26	$242	$172,195	$172,240	$26,761	$26,806	$26,642	$26,858
Tier 2 (2022)	**$172,050**	**$26,616**	8	$145	$190	$26	$242	**$172,195**	**$172,240**	**$26,761**	**$26,806**	**$26,642**	**$26,858**

* Includes owner/operator time cost allowance (2hrs. X $50/hr. = $100) for initial application prep time only.

** This is the first full year after the compliance date for this engine catergory/Tier. Also the start of the cost amortization period for this category/Tier.

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE AB 2588 AIR TOXICS "HOT SPOTS" EMISSION INVENTORY CRITERIA AND GUIDELINES REGULATION

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 AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines (Guidelines) Regulation.

DATE: November 16, 2006

TIME: 9:00 a.m.

PLACE: California Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., November 16, 2006, and may continue at 8:30 a.m., November 17, 2006. This item may not be considered until November 17, 2006. Please consult the agenda for the meeting, which will be available at least 10 days before November 16, 2006, to determine the day on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette, or computer disk. Please contact ARB's Disability Coordinator at (916) 323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at (916) 323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected

Proposed amendment to title 17, California Code of Regulations (CCR), section 93300.5 and the AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Report (including appendices), incorporated by reference in title 17, CCR, section 93300.5, last amended on May 15, 1997.

Background

The Air Toxics "Hot Spots" Information and Assessment Act ("Hot Spots" Act or Program; AB 2588; Stat. 1987, ch 1252; Health and Safety Code Sections 44300

through 44394) provided one of the fundamental building blocks of California's air toxics program. Subsequent legislation (SB 1731) in 1992 established a mechanism to reduce significant risks to health protective levels. The "Hot Spots" Act, as amended, requires the Board to compile and maintain a list of substances presenting a threat to public health. Facilities manufacturing, formulating, using, or releasing any of the listed substances must prepare an emissions inventory plan, implement the plan, and report to the air quality management district or air pollution control district (district). Facilities with higher prioritization scores, based on the emission inventory, must prepare, and submit to the district, a risk assessment in accordance with the guidelines established by the Office of Environmental Health Hazard Assessment (OEHHA). Upon approval of the health risk assessment, the operator of the facility must provide notice to exposed persons of the results of the health risk assessment. In addition, if the risk assessment identifies a significant risk, the facility operator must conduct an airborne toxic risk reduction audit, develop a plan to implement risk reduction measures, and implement the plan to reduce the risk below the significant risk level.

The Emission Inventory Criteria and Guidelines Report, including its appendices ("Guidelines Regulation," which is incorporated by reference in Title 17, California Code of Regulations, Section 93300.5) provides direction and criteria to facilities on how to compile and submit air toxics emission data required by the "Hot Spots" Program. The Guidelines Regulation describes those facilities that must comply, outlines procedures for preparing updates to the emission inventories and reporting requirements for specific classes of facilities whose emissions of all criteria pollutants did not exceed ten tons per year, and lists substances that must be inventoried.

The objective of the "Hot Spots" Act is to collect emission data on air toxics emitted in California so that nearby residents are notified of significant risks associated with those facilities posing unacceptable localized health risks, and that the facilities take steps to reduce those risk to health protective levels.

After the last update to the Guidelines Regulation in 1997, much has happened with respect to our understanding of toxic air pollution. Most notably, diesel particulate matter (diesel PM) was listed as a toxic air contaminant (TAC) by ARB in 1998 after an extensive review and evaluation of the scientific literature by OEHHA. Diesel PM is the most important TAC and contributes over 70 percent of the estimated risk from air toxics today. In September 2000, ARB approved the "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles" (Diesel Risk Reduction Plan) which initiated a multi-year effort to reduce exposures from diesel PM throughout the State. The Diesel Risk Reduction Plan established the goal of reducing diesel PM emissions and the associated cancer risk by 85 percent in 2020. Pursuant to the Diesel Risk Reduction Plan, ARB has adopted several air toxic control measures to reduce diesel PM, including the "Airborne Toxic control Measure for Stationary Compression Ignition Engines" (stationary engine ATCM), which was adopted in 2004. In addition, health effects values for some toxic air pollutants have been updated and risk assessment methodologies have been adopted by OEHHA.

Staff is proposing amendments to the Guidelines Regulation to reflect these developments described above and to harmonize to the extent possible, the "Hot Spots" Program with actions taken by ARB to address diesel engines.

Description of the Proposed Regulatory Action

The proposed amendments to the Guidelines Regulation incorporate four basic modifications to the Guidelines Regulation:

- Create new Section XI that specifies "Hot Spots" requirements for diesel engines that harmonize with the stationary engine ATCM and proposed amendments to the ATCM to incorporate requirements for in-use diesel engines used in agricultural operations;

- Augment the existing 3,000 gallon diesel fuel reporting threshold with an additional 20 engine hours per year total at a facility reporting threshold for diesel engines;

- Incorporate by reference the OEHHA Health Risk Assessment Guidelines and new health values, and update the list of substances; and

- Add definitions for diesel engines, emergency operations and other terms that are consistent with the ATCM for stationary diesel engines.

By aligning the "Hot Spots" reporting requirements for stationary diesel engines in Section XI of the Guidelines Regulation, we are leveraging the inventory reporting and risk reduction activities that are already occurring under the stationary engine ATCM. Including definitions related to diesel engines ensures clarity in the procedures and consistency with the existing ATCM for stationary diesel engines. Using the same definitions in multiple regulations simplifies compliance with requirements. In addition, by aligning the "Hot Spots" requirements with the proposed amendments to the stationary engine ATCM to incorporate requirements for in-use diesel engines used in agricultural engines, we are ensuring that operators of agricultural engines will not be subject to duplicative requirements and that the risk from all engines is adequately addressed.

The new reporting threshold is needed to ensure that emissions from diesel engines that result in potential exposures to nearby receptors are brought into the "Hot Spots" Program and are properly evaluated and addressed under the "Hot Spots" Program. The current 3,000 gallon diesel fuel reporting threshold is not health protective, given the cancer potency for diesel PM.

The proposed amendments also incorporate the OEHHA Health Risk Assessment Guidance Manual and health values, which have already gone through a public process and were adopted by OEHHA in 2003. The ARB staff is also proposing amendments to the Guidelines Regulation which will update the list of substances required to be reported from facilities subject to the program. Nine new substances

are being proposed for inclusion in the "Hot Spots" list of substances for which emissions must be quantified. Minor changes to existing substances are also being proposed, such as correction to Chemical Abstracts Service numbers, or correction of the chemical name.

In addition, there are several miscellaneous changes to the Guidelines Regulation, including definitions, reporting formats and procedures for screening health risk assessments, which align "Hot Spots" procedures with existing district program needs.

COMPARABLE FEDERAL REGULATIONS

The "Hot Spots" Act established an air quality program unique to the State of California. At this time, no equivalent federal requirement targets "Hot Spots" facilities. Accordingly, there is no conflict or duplication between the Guidelines Regulation and current federal regulations.

AVAILABILITY OF DOCUMENTS AND AGENCY CONTACT PERSONS

The Board staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: "Initial Statement of Reasons for Proposed Rulemaking for the Proposed Amendments to the Emission Inventory Criteria and Guidelines Report for the Air Toxics "Hot Spots" Program."

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 on **November 16, 2006.**

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 regulation may be directed to the designated agency contact persons, Dale Shimp, Manager of the Environmental Justice Section, at (916) 324-7156 or by email at dshimp@arb.ca.gov, or Chris Halm, Air Pollution Specialist (916) 323-4865, chalm@arb.ca.gov.

Further, the agency representative and designated back-up contact person to whom nonsubstantive inquiries concerning the proposed administrative action may be directed to Alexa Malik, Regulations Coordinator, (916) 322-4011. 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 www.arb.ca.gov/regact/hotspot06/hotspot06.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 and private persons and businesses in reasonable compliance with the proposed amendments are presented below.

The Executive Officer has determined that the proposed regulatory action will create costs, as defined in Government Code section 11346.5(a)(6), to State agencies. The costs to ARB to implement and administer the Air Toxics "Hot Spots" Program, including the amended Guidelines Regulation, will be recovered by fees authorized by H&SC section 44380 and sections 90700-90705 of title 17, CCR. 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 in the federal funding to any state agency or program, or impose other nondiscretionary costs or savings to local agencies, except as described below.

The Executive Officer has determined that the proposed amendments will impose a mandate upon and create costs to the districts with jurisdiction over facilities subject to the "Hot Spots" Act. However, the mandate does not require state reimbursement to the districts pursuant to Government Code sections 17500 et seq., and section 6 of Article XIIIB of the California Constitution because the districts have the authority to levy fees sufficient to pay for the mandated Program (H&SC section 44380). These fees are intended to recover the costs of district implementation of the Air Toxics "Hot Spots" Program, including compliance with the proposed amendments.

The Executive Officer has determined that the proposed amendments will impose a mandate upon and create costs to some public agencies that manage entities such as publicly owned treatment works or correctional facilities. These facilities will be impacted by the proposed amendments to the extent they operate diesel engines and the risks are above district threshold levels. The costs of complying with the Regulation are not reimbursable within the meaning of section 6, article XIIIB, California Constitution and Government Code sections 17500 et seq., because these facilities are authorized to levy service charges to cover the costs associated with the mandated Program.

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on public and private facilities. ARB staff estimates that the cost for compliance with the proposed amendments to the Guidelines Regulation to be approximately

8.1 million dollars. This corresponds to about 2 million dollars annually for the years 2007-2010. This cost, which is based on 2006 dollars, represents the costs associated with compliance with the "Hot Spots" program such as inventory reporting, health risk assessment, State and district fees, and risk reduction.

Facilities will be potentially subject to "Hot Spots" State and district fees if their cancer risk exceeds 1 per million. Because the ATCM satisfies many of the "Hot Spots" requirements, the minimum State fee of $35 will be assessed for facilities subject to "Hot Spots" with only diesel engines, like schools, hospitals, and amusement parks. Facilities already subject to "Hot Spots" fees are still subject to the same State fee rates in section 90700-90705, title 17, California Code of Regulations, which range from $67 to $6,363.

California businesses are affected by the proposed annual cost of compliance with the amendments to the extent that the implementation of the proposed amendments reduces their profitability. Overall, most affected businesses will be able to absorb the costs of the proposed amendments with no significant adverse impacts on their profitability. This finding is based on the staff's analysis of the estimated change in "return on owner's equity" (ROE). The analysis found that the overall change in ROE to be negligible. As the proposed amendments would not alter significantly the profitability of most businesses, staff does not expect a noticeable change in employment, business creation, elimination, or expansion, and business competitiveness in California.

Therefore, 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 state, 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.

In accordance with Government Code sections 11346.3(c) and 11346.5(a)(11), the Executive Officer has found that the reporting requirements of the regulation 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 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 15, 2006,** and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal : http://www.arb.ca.gov/lispub/comm/bclist.php

Facsimile submittal: (916) 322-3928

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.

Additionally, the Board requests but does not require, that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

STATUTORY AUTHORITY AND REFERENCES

This regulatory action is proposed under that authority granted in Health and Safety Code, sections 39600, 39601, and 44342. This action is proposed to implement, interpret and make specific sections 41805.5, 44320, 44321, 44322, 44323, 44324, 44325, 44340, 44341, 44342, 44343, 44344, 44344.4, 44344.5, 44344.7, 44346, 44360, and 44365 of the Health and Safety Code. Section 6254.7 of the Government Code, and 17, CCR, Sections 90700-90705, Appendix A.

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 ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, CA 95814, (916) 322-2990. The document will also be posted on the web site listed above.

CALIFORNIA AIR RESOURCES BOARD

Catherine Witherspoon
Executive Officer

Date: September 19, 2006

State of California
California Environmental Protection Agency
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

Public Hearing to Consider

PROPOSED AMENDMENTS TO THE EMISSION INVENTORY CRITERIA AND GUIDELINES REPORT FOR THE AIR TOXICS "HOT SPOTS" PROGRAM

To be considered by the Air Resources Board on November 16-17, 2006, at:

California Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, CA 94102

Reviewed and Approved By

Linda Murchison, Chief, Planning and Technical Support Division
Peggy Taricco, Chief, Emission Inventory Branch
Dale Shimp, Manager, Environmental Justice Section

This report has been prepared by the staff of the Air Resources Board. Publication does not signify that the contents reflect the views and policies of the Air Resources Board.

State of California
AIR RESOURCES BOARD

PROPOSED AMENDMENTS TO THE EMISSION INVENTORY CRITERIA AND GUIDELINES REPORT FOR THE AIR TOXICS "HOT SPOTS" PROGRAM

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Research Division
Stationary Source Division
California Air Pollution Control Officers Association
Office of Environmental Health Hazard Assessment

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EXECUTIVE SUMMARY

The Air Toxics "Hot Spots" Information and Assessment Act ("Hot Spots" Program or Act; AB 2588; Stat. 1987, ch 1252; Health and Safety Code Sections 44300 through 44394) provided one of the fundamental building blocks of California's air toxics program. The "Hot Spots" Act set in motion steps to collect emission data on air toxics emitted in California, to identify those facilities with unacceptable localized health risks, and to ensure nearby residents were notified of significant risks. Subsequent legislation (SB 1731) in 1992 established a mechanism to reduce significant risks to health protective levels.

Major benefits have resulted from implementation of the "Hot Spots" Program over the past 17 years. The toxic pollutant information collected pursuant to the Act played a major role in the development of a statewide toxics emission inventory which provides data for public requests for toxics information, and provides essential information for the development of risk assessments and cost-effective risk reduction measures. More importantly, exposures to toxic air emissions have been reduced as facilities throughout the State implement measures to reduce toxic air pollutant emissions and reduce public health risks resulting from their operations.

The Emission Inventory Criteria and Guidelines Report and Regulation ("Guidelines Regulation", Section 93300.5, Title 17, California Code of Regulations) provides direction and criteria to facilities on how to compile and submit air toxics emission data required by the "Hot Spots" Program. The Guidelines Regulation was first adopted by the Air Resources Board (ARB or Board) in 1989 and subsequently amended several times to reflect new data, and to streamline the reporting process.

The purpose of this staff report is to describe proposed amendments to the Guidelines Regulation to reflect the identification of diesel particulate matter (diesel PM) as a toxic air contaminant (TAC) in 1998. The proposed amendments also harmonize "Hot Spots" requirements with the airborne toxic control measure (ATCM, Section 93115, Title 17, California Code or Regulations (CCR)) for stationary diesel engines, which was adopted by the Board in 2004, and the proposed amendments to the ATCM currently under development that will address in-use agricultural diesel engines. This is being done to minimize duplicative requirements, and to ensure that potential risks from all engines are evaluated and mitigated where necessary. The proposed amendments also incorporate the Office of Environmental Health Hazard Assessment (OEHHA) Health Risk Assessment Guidelines and health values, which have already gone through a public process. The proposed amendments add a new chapter on diesel engine reporting requirements and other minor revisions to bring the Guidelines Regulation up to date. In essence, the proposed amendments to the Guidelines Regulation are written to have the "Hot Spots" Program catch up with existing actions already being taken to address diesel engines and other activities already being implemented in California.

Overall, the amendments are designed to leverage the inventory reporting and risk reductions that are required under the stationary diesel engine ATCM and the

proposed ATCM amendments for in-use agricultural engines. The proposed amendments were written to minimize duplicative efforts, and to focus requirements on those facilities that may have significant residual risk after the ATCM is fully implemented.

Presented here is an overview of the "Hot Spots" Program; the proposed amendments to the Guidelines Regulation; the technical justification for these amendments; the environmental and economic impacts from the proposed modifications; and a description of the public outreach conducted during the development of the proposed amendments. For simplicity, the discussion is presented in question-and-answer format using commonly asked questions about the proposed amendments. It should be noted that this summary provides only a brief discussion on these topics. The reader is directed to subsequent chapters of the report for more detailed information.

1. What is the "Hot Spots" Program?

The "Hot Spots" Program was created by the Air Toxics "Hot Spots" Information and Assessment Act of 1987 and its subsequent amendments (AB 2588; Stats. 1987, ch. 1252; Health and Safety Code Sections 44300 through 44394). The "Hot Spots" Act was established to inform and protect the California public from exposures to toxic air pollutants. The Act established a program to inventory emissions of toxic substances emitted into the air, and to assess the public health risk to those who are exposed. The Act requires that toxic air emissions from stationary sources (facilities) be quantified and compiled into an inventory according to criteria and guidelines developed by ARB. The Act also requires that each facility be prioritized to determine whether a health risk assessment must be conducted, that the risk assessments be conducted according to methods developed by OEHHA, that the public be notified of significant risks posed by nearby facilities, and that emissions which result in a significant risk be reduced.

2. How do facility operators know what is required of them under the "Hot Spots" Program?

The "Hot Spots" Act requires ARB to adopt a regulation that specifies how local air districts implement the "Hot Spots" Program. In 1989, ARB adopted the Guidelines Regulation which specifies which facilities are subject to air toxics emission inventory reporting, and identifies what information a facility operator must include in the emission inventory plan and inventory report. The local air districts implement the requirements in the Guidelines Regulation as part of their regular "Hot Spots" Program activities. The Guidelines Regulation has been updated several times over the past 17 years to reflect new information, and to streamline the reporting requirements.

3. Why is ARB staff proposing amendments to the Guidelines Regulation?

ARB staff is proposing amendments to the Guidelines Regulation to reflect new regulations regarding diesel engines, and air toxics information compiled since the last update of the Guidelines Regulation in 1997. Specifically, these amendments are

being triggered by the identification of diesel PM as a TAC, and the need to harmonize "Hot Spots" with the stationary diesel engine ATCM, including proposed amendments to the ATCM that address in-use agricultural engines that the Board will consider for adoption in November 2006.

The stationary diesel engine ATCM, which was adopted by ARB in 2004, requires owners and operators of in-use diesel-fueled engines that are used in non-agricultural stationary applications to report to the district information on each engine, to meet specified diesel PM emission standards and operating requirements, and to use clean fuels. Implementation of the ATCM will reduce diesel PM emissions and resulting exposures from stationary diesel engines throughout California. In a large proportion of cases, compliance with the ATCM will bring the potential cancer risk from the stationary diesel engines at a facility below the district's "Hot Spots" risk reduction threshold. While the requirements for in-use engines in the ATCM currently only apply to engines in non-agricultural applications, the ATCM also includes emission standards for new stationary engines, and reporting requirements for the sellers of new stationary diesel engines used in both non-agricultural and agricultural applications. However, as mentioned previously, ARB staff is currently proposing amendments to the ATCM to incorporate requirements for in-use agricultural diesel engines.

The amendments being proposed to the Guidelines Regulation are more fully explained in the following questions and answers. Overall, the amendments are designed to leverage the inventory reporting and risk reductions that are required under the stationary diesel engine ATCM and the proposed ATCM amendments for in-use agricultural engines. The proposed amendments were written to minimize duplicative requirements, and to focus efforts on those facilities that may have significant residual risk after the ATCM is fully implemented. The amendments also include incorporation of the OEHHA Risk Assessment Guidelines and updated health values, and the addition of new substances to the "Hot Spots" list of substances.

4. How have diesel engines been addressed in the past?

Under the current version of the Guidelines Regulation, facilities that emit less than 10 tons per year of a criteria pollutant must meet "Hot Spots" requirements if they use 3,000 or more gallons per year of diesel fuel (crude, residual, distillate, or diesel oil). This reporting threshold was based on speciated diesel exhaust (primarily benzene), rather than the cancer potency factor for diesel PM which was not defined at the time the original threshold was established. Many diesel engine operators have not been subject to "Hot Spots" requirements because of this usage requirement. In August 1998, ARB approved the listing of diesel PM as a TAC, and the Scientific Review Panel concluded that a value of 3×10^{-4} $(ug/m^3)^{-1}$ is a reasonable estimate of unit risk from diesel-fueled engines. With the approval of this unit risk factor, the current "Hot Spots" threshold for diesel engines of 3,000 gallons per year of diesel fuel is no longer health protective. Therefore, the Guidelines Regulation needs to be updated to ensure that diesel engines with potential significant risk will be subject to review under the "Hot Spots" Program.

5. What amendments are being proposed to the Guidelines Regulation?

The proposed amendments include a reporting threshold for diesel engines based on the cancer potency for diesel exhaust particulate (diesel PM), and a method to streamline the reporting and risk evaluations for diesel engines. Staff is also proposing to incorporate the most recent OEHHA Health Risk Assessment Guidelines in the "Hot Spots" Guidelines Regulation. This includes new and updated health values. Updates to the list of substances are also being proposed. Table ES-1 provides a brief summary of the proposed amendments. Additional details and explanations for the amendments are provided in Chapter II.

Table ES-1: Summary of Proposed Amendments to the Guidelines Regulation

Guidelines Regulation Element	Proposed Amendments
Requirements for Diesel Engines	• Create new Section XI that specifies "Hot Spots" requirements for diesel engines. • Augment existing 3,000 gallon diesel fuel reporting threshold with an additional 20 engine hours per year total at a facility reporting threshold for diesel engines. • Establish a "diesel-engine only" classification, which can be used as a basis for streamlining reporting requirements and fees. • Incorporate definitions for diesel engines, emergency use and others that are consistent with the ATCM for stationary diesel engines. • Align reporting requirements with those in the ATCM. • Assess State fees for "diesel engine only" facilities at the State rate for industrywide facilities.
Risk Assessment Guidelines	• Incorporate OEHHA Risk Assessment Guidelines that contain updated health values, including the cancer potency for diesel PM.
Substances Subject to the Program	• Update Appendix A-I with new substances. • Specify that only *respirable* crystalline silica should be reported. • Expand classes of listed substances to include individual species. • Adjust reporting levels (degree of accuracy) to reflect new health values.
Appendix E Source Categories	• Clarify that thermal spraying is subject to reporting.

6. How do the new diesel engine provisions in Section XI of the proposed amendments to the Guidelines Regulation relate to the other requirements in the Guidelines Regulation?

Section XI is being added to the Guidelines Regulation to detail the provisions that specifically apply to stationary diesel engines in the "Hot Spots" Program. It describes how the "Hot Spots" requirements relate to the requirements of the stationary diesel ATCM. In general, the provisions in Section XI supersede other requirements in the Guidelines Regulation for diesel engines.

7. How do the proposed amendments harmonize with the ATCM for stationary diesel engines?

The proposed amendments take advantage of the reporting and risk reductions that are resulting from implementation of the ATCM. For the majority of facilities with diesel engines, compliance with the ATCM will satisfy the "Hot Spots" reporting and risk reduction requirements. Facilities with multiple diesel engines may be subject to "Hot Spots" notification requirements, and may need to achieve additional diesel PM emissions reductions beyond those required by the ATCM in the event that there is significant residual risk at the facility.

8. If a diesel engine is not subject to the ATCM for stationary diesel engines, or if it qualifies for an exemption under the ATCM, is it also exempt from "Hot Spots"?

The "Hot Spots" Program has specific reporting requirements that are independent of other rules, regulations, permit conditions, or other air pollution control laws, including ARB's ATCM for stationary diesel engines. Therefore, an engine that is exempt from the ATCM is not automatically exempt from "Hot Spots" reporting requirements. Many of the diesel engine applications exempted from the ATCM emission reduction requirements are low-risk or at remote locations, and as a result most of these engines will be below "Hot Spots" public notification and risk reduction thresholds.

In other cases, however, there may be compelling public safety or national security reasons that will make implementing risk reduction (engine retrofit or replacement) infeasible for some diesel engine applications, including military tactical support equipment, direct-drive fire pumps that must meet National Fire Protection Association (NFPA) specifications, and stationary diesel engines at nuclear power plants that are subject to the requirements of the United States Nuclear Regulatory Commission. Under the stationary diesel engine ATCM these engines are exempt from meeting the emission limits and performance standards because ARB staff found that it was not feasible to retrofit or replace these engines because of other regulatory or operational requirements that the engines must meet. Based on a review of these diesel engine applications, ARB recommends that districts adopt alternate risk reduction requirements for these categories. Options could include raising, delaying, or waiving risk reduction requirements for these engine applications. Other sources of toxic pollutants at the facility would still be subject to the "Hot Spots" Program and public notification, if triggered, would still be required.

9. Are emissions due to emergency operations subject to "Hot Spots" reporting? How is an emergency defined?

Emergency operations are not subject to "Hot Spots" reporting. Emergency operations are neither routine nor predictable, as stated in Health and Safety Code (H&SC) Section 44303. The definition of emergency use for diesel engine operations is the same definition as in the ATCM. In general, an emergency is a power outage, fire, flood, or sewage overflow.

10. Are portable diesel engines, and diesel engines that are equal to or less than 50 horsepower, subject to "Hot Spots"?

Any equipment that is used as part of "routine and predictable" operations at a facility is potentially subject to "Hot Spots." This includes emissions from portable diesel engines and diesel engines that are equal to or less than 50 horsepower. Because of the variability of size and uses for these engines, under the "Hot Spots" Program, local air districts are responsible for determining what constitutes routine and predictable operations at facilities under their jurisdiction.

Under the proposed amendments, the districts are given discretion to request information on these engines if the district determines that the use of these engines is routine and predictable, and the district determines there is good cause to expect the engines at the facility may pose a significant risk. This means low-risk activities that could be considered routine and predictable by the district are not likely to be subject to "Hot Spots" reporting requirements. It is anticipated that the district will use factors such as distance from the engine to the nearest downwind receptor, hours of operation, and the frequency and type of operations when determining what constitutes a potential significant risk.

11. How will the proposed amendments affect diesel engines used in agricultural operations?

The Board will consider amendments to the stationary diesel engine ATCM to include in-use agricultural engines at the same public hearing as the proposed amendments to the Guidelines Regulation will be considered. The proposed amendments to the ATCM contain an engine registration program that will collect information on agricultural engines in the State. The proposed amendments also include performance standards for engines that will result in significant reductions in diesel PM from these engines as the ATCM is implemented (the existing ATCM already contains performance standards for new agricultural engines). In essence, the registration requirement will satisfy the plan and report emission inventory requirement in the "Hot Spots" Program, and the performance standards will result in compliance with the "Hot Spots" risk reduction requirements for the vast majority of agricultural engines.

In order to minimize duplicative requirements and allow the risk reduction requirements in the ATCM to take effect, ARB staff is proposing to postpone "Hot Spots" applicability requirements for diesel engines at agricultural operations until after 2011. This action is being proposed because the adoption of the ATCM or equivalent district rule or program sets in motion actions to reduce risks in the near future. This schedule allows engine operators five years to focus on cleaning up stationary diesel engines at agricultural operations through the ATCM process before triggering "Hot Spots" requirements.

In addition, ARB, local air districts, and the agricultural industry have agreed to work together in the near-term to identify agricultural engines near schools, residences, or other sensitive sites to ensure that the risk from these engines will be reduced as

quickly and efficiently as possible. This near-term effort will encourage agricultural operators with engines near receptors to take advantage of incentive programs available for agricultural engine electrification (Pacific Gas and Electric's Agricultural Internal Combustion Engine Conversion Inventive Program and Southern California Edison's Time-of-Use Pumping Agricultural Internal Combustion Engine Program) or the Carl Moyer Program. Through this effort, it is anticipated that by the end of 2011 the vast majority of engines that would likely pose a significant risk will have been replaced, and the districts will have already ensured that facilities with new engines being installed will be below the district's risk reduction threshold.

12. How do the revisions to the Guidelines Regulation relate to the San Joaquin Valley Unified Air Pollution Control District's agricultural engine Rule 4702?

The San Joaquin Valley Unified Air Pollution Control District's Rule 4702, "Internal Combustion Engines – Phase 2," establishes requirements for stationary diesel engines used in agricultural and non-agricultural applications. While this rule was specifically adopted to limit the emissions of nitrogen oxides, carbon monoxide, and volatile organic compounds, the requirements were such that the most practical compliance route will be to install a new certified diesel engine. Because of this, the resulting schedule of engine replacements contained in the rule will reduce the emissions and risk due to diesel PM as newer engines replace older engines. The rule has a compliance schedule which calls for the replacement of most non-certified compression ignition agricultural engines with United States Environmental Protection Agency (U.S. EPA) Tier 3 or Tier 4 certified engines by July 1, 2011.

Similar to the discussion above, because a process leading to risk reduction from agricultural engines is already underway due to this rule, the proposed postponement of "Hot Spots" requirements until after 2011 in the Guidelines Regulation will allow these emission reductions to take place before undergoing "Hot Spots" review. ARB, the San Joaquin Valley Unified Air Pollution Control District, and the agricultural industry will also be working together to identify potentially high risk stationary agricultural engines to ensure that the risk from these engines will be reduced below district thresholds as quickly and efficiently as possible.

13. Why should diesel PM be incorporated in the health risk assessment for a facility?

Scientific studies have found that diesel exhaust has a high cancer potency. As a result of these findings, ARB identified diesel exhaust as a toxic air contaminant in August 1998. The OEHHA Health Risk Assessment Guidelines provide an inhalation non-cancer chronic reference exposure level (REL) and an inhalation cancer potency factor based on whole diesel exhaust (gas and particulate matter). The surrogate for whole diesel exhaust is diesel particulate matter (diesel PM), which is the basis for the potential risk calculations.

Because of the high cancer potency of diesel PM and the fact that some facilities operate dozens of diesel engines, it is important that diesel PM be incorporated in a

facility risk assessment. In addition, most diesel emissions from stationary engines take place at ground level. This increases the possibility that significant risks may affect nearby receptors.

Risk assessments for "Hot Spots" are prepared in accordance with guidelines established by OEHHA (generally referred to as the OEHHA Risk Assessment Guidelines). The proposed amendments will incorporate by reference *Part I. The Determination of Acute Reference Exposure Levels for Airborne Toxicants; Part II. Technical Support Document for Describing Available Cancer Potency Factors; Part III. The Determination of Chronic Reference Exposure Levels for Airborne Toxicants; Part IV. Exposure Assessment and Stochastic Technical Support Document; and the Air Toxics "Hot Spots" Program Guidance Manual for Preparation of Health Risk Assessments (2003).* These documents have superseded the California Air Pollution Control Officers Association (CAPCOA) Risk Assessment Guidelines (1992), and are already in routine use by air districts.

14. What new substances and health values are being added through the "Hot Spots" amendments?

H&SC Section 44321 requires ARB to compile and maintain a list of substances that are recognized as presenting a chronic or acute threat to public health. This list is based on designated lists of substances compiled by federal and State regulatory programs referenced in the statute. The statute also gives ARB authority to include any additional substances recognized by the Board as presenting a chronic or acute threat to public health when present in the ambient air. The staff has reviewed the lists referenced in H&SC Section 44321, including the list of substances subject to emission reporting under the federal Title III, Section 313 of the Superfund Amendments and Reauthorization Act, also known as the federal Toxics Release Inventory substances. As a result of this review, ARB staff is proposing to update the list of substances to reflect new information. Nine new substances are being proposed for inclusion in the Appendix A-I list of substances for which emissions must be quantified. In addition, minor changes to existing substances are being proposed, such as correction to Chemical Abstracts Service numbers, or correction of the chemical name. For several classes of compounds, the individual substances belonging to those classes are being listed because new health values have been developed for them. For crystalline silica, the term "respirable" refers to particles with mean mass aerodynamic diameter 4 microns or less. Facilities that emit these particles may need to report these emissions to the district. A summary of the changes to the substance list is provided in Table ES-2.

Table ES-2: Updates to List of Substances

New Substances	1) Bromine pentafluoride 2) t-Butyl acetate 3) Hydrogen bromide 4) Hydrogen selenide 5) Oleum 6) Polybrominated diphenyl ethers (PBDEs) 7) Perfluorooctanoic acid (PFOA) and its salts and derivatives 8) Sulfur trioxide 9) Vanadium pentoxide
Specific Substances Added to Chemical Group Already Listed	1) 2-Chlorophenol 2) 4-Nitropyrene 3) 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 4) 3,4,4',5-Tetrachlorobiphenyl (PCB 81) 5) 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 6) 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 7) 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8) 2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9) 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) 10) 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) 11) 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 12) 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 13) 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 14) Tetrachlorophenols 15) Trimethylbenzenes
Added from Appendix A-II*	1) N-Nitrosodiphenylamine 2) 5-Nitroacenaphthene
Change to CAS Numbers or Chemical Name	1) Cyanide compounds 2) Hexachlorocyclohexanes 3) Nickel carbonate 4) Toluene diisocyanates 5) Xylenes 6) 1,2,3,4,6,7,8,9-Octachlorodibenzofuran
Adjustment of Particle Size for Reporting	1) Silica, respirable crystalline

* These substances were required to be reported in the past but now must be quantified as part of the emission inventory because health values are now available.

15. How should substances with health values but no source test method be addressed under the "Hot Spots" Program?

ARB staff is currently working with districts and industry to determine if new source test methods are available for several substances that are subject to the AB 2588 "Hot Spots" Program, including acrolein and crystalline silica. For most cases, ARB recommends that districts postpone requiring reporting emissions of those substances

until adequate emission factors and source test methods are available. This may entail participation by facilities in the development of source test methods or emission factors until test methods have been identified. These efforts will be coordinated by both ARB and districts, and, to the greatest extent possible, allow businesses to use default screening (health protective) emission factors whenever possible.

16. What effect will incorporating the OEHHA Health Risk Assessment Guidelines and updates to health values and the list of substances have on businesses?

The incorporation of the OEHHA Health Risk Assessment Guidelines and updates to the list of substances may result in facilities needing to update a past health risk assessment. This will likely apply to large facilities that had previously conducted a health risk assessment but did not include diesel engines, or facilities that emit newly listed substances or substances that have new health values that could trigger new requirements. Most updates to the health values will not have a significant impact on expected risk levels. However, based on the updated health values for naphthalene and several other substances, there may be facilities that will need to update their health risk assessment to take into account the new and updated health values. This can be triggered by the district calculating a new prioritization score based on new emissions or new health values for emitted substances. Some districts have already begun this process.

17. What businesses will be affected by the proposed amendments?

Most of the facilities that will be impacted by the proposed amendments to the Guidelines Regulation are facilities that operate any number of stationary diesel (compression ignition) engines for more than 20 hours per year on a routine and predictable basis. These facilities will now be subject to review under the "Hot Spots" Program. Large industrial facilities with diesel engines like refineries and power plants, which had previously been subject to "Hot Spots", will need to determine whether including the risk from diesel engines will trigger additional "Hot Spots" requirements. Facilities with emergency standby (backup) diesel engines such as office buildings, schools and universities, water treatment plants, hospitals, banks, hotels, wineries, military installations, and prisons may also be subject to the proposed amendments. The district will help these facilities determine if the ATCM satisfies any applicable "Hot Spots" requirements. Also, facilities that emit any of the newly listed substances or substances with updated health values may also now be subject to additional "Hot Spots" requirements.

18. Will all facilities with diesel engines have to pay fees?

There are an estimated 13,500 facilities in California that operate stationary diesel engines. We anticipate that 80% of the 10,650 facilities with a single stationary diesel engine will pay no additional State fees related to "Hot Spots". In most of these cases, we do not anticipate any new or increased district fees for these facilities. This is because most of these facilities do not exceed the reporting threshold of 20 hrs/year

combined total for the facility, and are therefore not subject to "Hot Spots" reporting. For these facilities, compliance with the ATCM will satisfy "Hot Spots" risk reduction and reporting requirements through compliance with the ATCM. The remaining facilities, those that operate diesel engines more than 20 engine hours per year combined total or have multiple diesel engines, will need to go through the "Hot Spots" review process to determine if there are any applicable State and district fees. Facilities over this threshold with a risk of one or greater are likely to pay an annual State fee, unless they are already subject to "Hot Spots" fees for other sources of toxics at the facility. For these facilities with other toxics, State and district fees could increase from current levels, depending on the diesel risk at the facility.

ARB is proposing to treat diesel engine-only facilities similar to "industrywide" facilities, and use the same fee rate as "industrywide" facilities, which is currently $35 per year. Districts may take a similar approach for these diesel engine-only facilities in order to streamline facility evaluations. Because the State fee rates remain unchanged, it is not necessary to amend the AB 2588 "Hot Spots" Fee Regulation at this time. If the State fee rates in the Fee Regulation need to be changed, those amendments would go through the normal regulatory process.

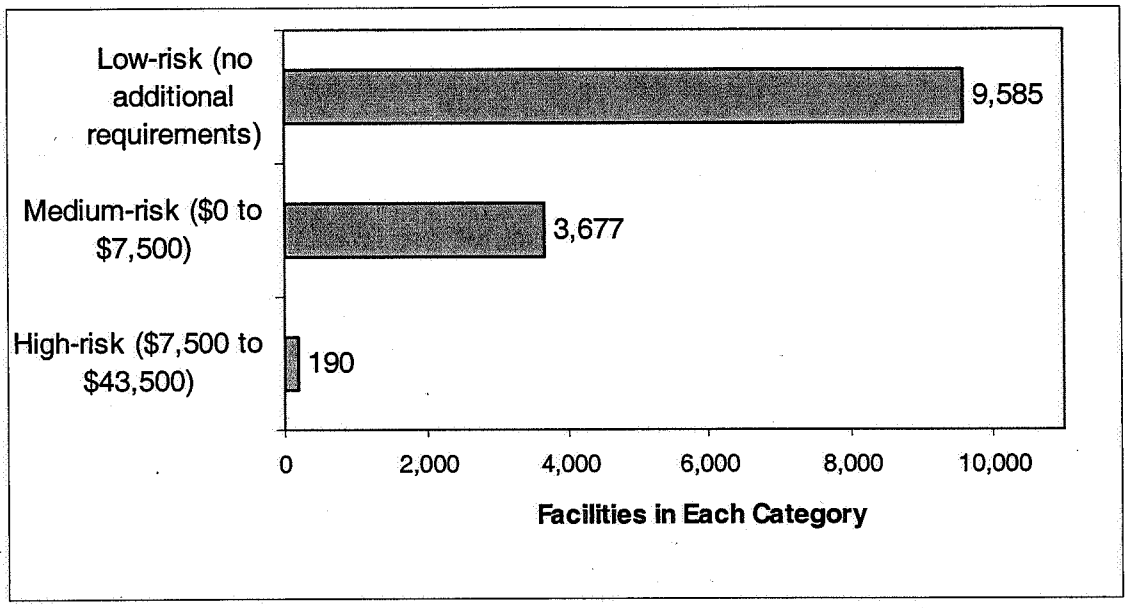
19. What are the economic impacts of the proposed amendments to the Guidelines Regulation?

We estimate the total costs associated with the proposed amendments to the Guidelines Regulation for facilities to be approximately $8.1 million. This corresponds to approximately $2 million dollars annually for four years in the 2007 through 2010 timeframe. The majority of these costs will be borne by facilities with diesel engines that are now subject to "Hot Spots" and have significant residual risk even after compliance with the ATCM. A smaller portion of the costs, about $1 million, will be incurred by facilities that emit substances that have new health values where the emissions of these substances trigger new reporting and health risk assessment requirements.

The cost for a business will likely depend on the number of diesel engines at a facility, the residual risk that remains after compliance with the ATCM, and whether the facility emits other toxics with new health values that trigger additional "Hot Spots" requirements. To determine the cost to a typical business with diesel engines, we used engine information that was submitted to the district pursuant to the reporting requirements in the ATCM. Using this information and estimates of costs associated with compliance with "Hot Spots" (inventory reporting, health risk assessment, State and district fees, and risk reduction), we estimated costs for facilities based on the number of engines at the facility.

A distribution of estimated facility costs is shown in Table ES-3, which summarizes the costs for facilities with stationary diesel engines to comply with the proposed amendments to the Guidelines Regulation. These facilities include businesses, publicly owned facilities, and other government facilities.

Table ES-3: Distribution of Facility Cost Estimates



California businesses are affected by the estimated costs of the proposed amendments to the extent that the implementation of the proposed amendments reduces their profitability. Overall, most affected businesses will be able to absorb the costs of the proposed amendments with no significant adverse impacts on their profitability. This finding is based on the staff's analysis of the estimated change in "return on owner's equity" (ROE).

The analysis found that the overall change in ROE ranges from negligible to a decline of about eight percent. Generally, a decline of more than ten percent in ROE suggests a significant impact on profitability. Because the proposed amendments would not significantly alter the profitability of most businesses, we do not expect a noticeable change in employment, business creation, elimination, or expansion, and business competitiveness in California.

20. What are the environmental impacts of the proposed amendments?

We anticipate no adverse environmental impacts associated with the proposed amendments. In the event a facility takes steps to reduce diesel PM beyond what is required by the ATCM, communities adjacent to facilities operating multiple diesel engines will see a benefit in decreased exposure to diesel PM, and the associated cancer risk.

21. How do the proposed amendments relate to ARB's goals for environmental justice?

Environmental justice is defined 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. ARB's Environmental Justice Policies are intended to promote the fair treatment of all Californians and cover the full spectrum of ARB's activities.

The proposed amendments to the Guidelines Regulation are consistent with the environmental justice policy to reduce health risks from toxic air contaminants in all communities, including low-income communities, and communities of color. The proposed amendments will ensure that potential risks from all engines are evaluated and mitigated where necessary. These amendments will provide air quality benefits for all Californians, particularly those residing in communities located near facilities in the "Hot Spots" Program.

The proposed amendments to the "Hot Spots" Program help to address community concerns about diesel emissions in communities, and cumulative risk from multiple sources of air toxics. The Guidelines Regulation determines which types of facilities must report their emissions, what information is provided to the public about air toxics, and the timeframe for that reporting. ARB staff is committed to providing clear guidance to the districts on which sources are covered by the proposed amendments to the Guidelines Regulation, and how the risk from diesel PM in communities is being addressed.

The "Hot Spots" Program is unique in that it includes emissions from the entire facility to evaluate risk, rather than relying on emission reductions by specific source categories (like stationary engines, boilers, or chrome plating tanks). In this way, the "Hot Spots" Program provides a critical backstop to many other State and district toxics programs that protects nearby receptors from residual risk from sources that are not sufficiently controlled. Although the "Hot Spots" Program may result in significant costs for some large facilities, it protects individuals from the cumulative health impacts that may result from multiple types of emissions from a single facility. This Program provides public right-to-know information about significant air pollution health risks posed by sources of pollution in communities.

22. What public outreach was conducted during the development of the proposed amendments?

In 2003, ARB staff discussed initial concepts for amending the Guidelines Regulation with stakeholders during the development of the ATCM for stationary diesel engines. Engine owners and operators were made aware of AB 2588 "Hot Spots" requirements at the same time that the ATCM requirements were being discussed. The proposed amendments were then revised to reflect comments received from stakeholders.

ARB staff continued to work with stakeholders to align the "Hot Spots" requirements with the ATCM when possible, and then conducted three workshops to discuss the proposed amendments to the Guidelines Regulation and the relationship to other ATCMs. Over 2,000 individuals, agencies, groups, and organizations that had expressed interest in the "Hot Spots" Program and/or the stationary diesel engine ATCM were notified via ARB's email list serve about the proposed amendments. The listserve includes representatives of business, hospitals, universities, military bases, public utilities, oil companies, and environmental groups. ARB staff also responded to numerous phone and email inquires regarding the proposed amendments, and met individually with stakeholders upon request.

ARB staff has also had monthly discussions with the CAPCOA Toxics and Risk Managers Committee over the past four years. The CAPCOA Board has also discussed the initial proposed changes to the Guidelines Regulation. Changes to the proposed amendments reflect the concerns of the CAPCOA Toxics and Risk Managers Committee and the CAPCOA Board.

23. What future activities are planned?

After Board consideration and approval of the proposed amendments, ARB staff will provide assistance to districts and affected businesses to implement the proposed amendments. ARB will provide screening tables to assist districts and facilities with risk evaluations, and work with districts to develop additional risk tools for more refined facility health risk assessments. ARB will also assist the districts in notifying the public about diesel engines.

24. What is staff's recommendation?

ARB staff recommends that the Board adopt the proposed amendments to the Emission Inventory Criteria and Guidelines Report described in this staff report, and amend Section 93330.5 of Title 17 of the California Code of Regulations to incorporate the September 2006 Guidelines Report by reference. ARB staff believes the proposed amendments will harmonize the "Hot Spots" requirements for diesel engines with the ATCM, while streamlining the process and ensuring that the risk from all diesel engines subject to the proposed amendments to the Guidelines Regulation are reduced to health protective levels.

I. PROGRAM BACKGROUND AND REQUIREMENTS

Chapter I provides the historical context for the Air Toxics "Hot Spots" legislation and an overview of the requirements of the program, including the role of the Emission Inventory Criteria and Guidelines Report and Regulation (Guidelines Regulation). This chapter also describes the background for the amendments that are being proposed to the Guidelines Regulation. It is important to note that the proposed amendments will streamline the procedure for stationary diesel engines, and as a result they will differ from the standard "Hot Spots" process described in this chapter. This is because the applicable Air Toxic Control Measure (ATCM) or equivalent district program will address most, if not all, "Hot Spots" emission reporting and risk reduction requirements for diesel engines through a separate process, and will eliminate, in most cases, the need to address these requirements through the "Hot Spots" Program.

A. Air Toxics "Hot Spots" Information and Assessment Act

The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) and subsequent amendments (the Act or Program; H&SC Sections 44300 through 44394) requires affected facility operators in the State to report the types and quantities of certain substances their facilities release into the air. Facility operators prepare and update emission inventory reports and submit these data to the districts for review and approval. The goals of the "Hot Spots" Act are to collect this emission information and make it available to the public, to identify and prioritize facilities having localized impacts, to assess health risks, and to notify nearby residents of significant risks. As amended in 1992 (by Senate Bill 1731, Calderon), the Act calls for owners of significant-risk facilities to reduce their risks below the level of significance within specified timeframes. The legislation was further amended in 1996 (by Assembly Bill 564), to include provisions to exempt specified low priority facilities from the "Hot Spots" Program, and to reinstate exempted facilities if specified criteria are met.

Under the Act, the Air Resources Board (ARB) has a number of responsibilities. ARB is to develop and adopt an Emission Inventory Criteria and Guidelines Regulation specifying emission reporting requirements and a list of substances covered. ARB is also to develop a program to make the emission data available to the public. The current database that contains the emission inventory is the California Emission Inventory Development and Reporting System (currently CEIDARS Version 2.5). The public can view the stationary source emission data on the web using ARB's Facility Search Tool at: http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php. The Act also calls for ARB to prepare a report to the legislature on the inclusion of classes of smaller facilities (published in June 1990), and to develop an air toxic emission inventory for mobile, natural, and areawide sources not subject to district permit requirements (initially published in May 1990). ARB has developed an ongoing, annual air toxics emission inventory including stationary, mobile, area-wide, and natural sources for 33 substances. The California Toxics Inventory (CTI) is available on the ARB web site at http://www.arb.ca.gov/toxics/cti/cti.htm. The Act also calls for ARB to adopt a fee regulation to recover the costs of implementing the program.

The Air Toxics "Hot Spots" Program has complemented ARB's existing air toxics identification and control programs. It has identified sources of air toxics not previously under evaluation, and it has provided exposure information needed to prioritize control measures and develop regulatory actions. By making facility operators more aware of their toxic emissions, the program has also generated voluntary reductions in the emissions of air toxics in California. The benefits of these actions include reduced risk to workers and the public, lower operational costs, demonstration of emission reduction options for other sources, and improved community relations.

B. The Air Toxics "Hot Spots" Process

The Air Toxics "Hot Spots" Act directs ARB to compile and maintain a list of substances posing concern for cancer, chronic, or acute health threats, when present in the air. ARB has organized and prioritized the list of several hundred substances which the Act identifies by reference. Facilities which manufacture, formulate, use or release a listed substance and which meet specified applicability criteria, are required to prepare site-specific air toxics emission inventory plans and inventory reports.

For facilities subject to the Act, the facility operator submits a comprehensive, site-specific emission inventory plan to the appropriate air district by a specified date. Each plan specifies how the facility operator will inventory the facility's emissions of toxic substances that appear on the list of substances subject to the Act. These emission inventory plans and reports are reviewed and approved by the local air pollution control and air quality management districts (district), and follow ARB's Guidelines Regulation. After reviewing the emission inventory data, the district ranks facilities into high, intermediate, and low priority categories to determine whether the facility prepares a health risk assessment. In establishing the priorities, the district considers the potency, toxicity, quantity, and volume of hazardous materials released from the facility, the proximity of the facility to potential human receptors, and any other factors that the district determines could indicate that the facility may pose a significant risk.

Facilities included in the district's highest priority category prepare a health risk assessment and submit it to the district. A health risk assessment, as defined under the Act, includes a comprehensive analysis of the dispersion of hazardous substances into the environment, the potential for human exposure, and a quantitative assessment of health risks associated with those levels of exposure. Health risk assessments are prepared in accordance with guidelines established by OEHHA. OEHHA has published guidance on calculating health risk assessments in the Air Toxics "Hot Spots" Program Risk Assessment Guidelines: The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, August 2003. One of the proposed amendments is the formal incorporation of the OEHHA Risk Assessment Guidelines into the Guidelines Regulation for the "Hot Spots" Program.

Once a risk assessment is reviewed by OEHHA and approved by the district, the district determines if there is a potential significant health risk associated with emissions from a facility. If the district determines that a facility is a significant risk, the facility operator

must notify exposed persons of the risk assessment results. The California Air Pollution Control Officers Association (CAPCOA) has published the Air Toxics "Hot Spots" Program Public Notification Guidelines (October 1992) to assist facility operators with methods for conducting public notification.

Facilities determined to have a significant risk must prepare an air toxic risk reduction audit and develop a plan to implement air toxic risk reduction measures. The audit and plan is submitted to the district within six months of the determination. It must describe the risk reduction methods the facility will use to reduce its risk below the level of significance within five years; however, the district may shorten or lengthen the time period (up to five additional years) under certain conditions. The Act prescribes civil penalties for failure to comply with its provisions, or for knowingly submitting false information.

Under the Act, certain facilities must update their emission inventories to ensure current information is available (H&SC Section 44344). The update requirements substantially reduce the update reporting requirements for most facilities except the significant risk facilities (those required to notify under the program, as discussed below). Low risk facilities are exempt from update reporting.

For small businesses or businesses where compliance with standard "Hot Spots" requirements could create an economic hardship, districts may assign certain classes of facilities to an "industrywide" category. The districts prepare the emission inventory for industrywide categories which are generally subject to lower fees. ARB is recommending to districts that facilities that are brought under "Hot Spots" review due solely to diesel engines be treated in a similar manner to "industrywide" facilities.

C. Emission Inventory Criteria and Guidelines Regulation

The Act directs ARB to adopt an Emission Inventory Criteria and Guidelines Regulation. The Guidelines Regulation specifies criteria for determining which emissions are reported, and guidelines for how those emissions are reported to the local district, including requirements for the inventory plans and reports, the use of source testing and other measurement or estimation methods, and the list of substances to be reported.

The original Emission Inventory Criteria and Guidelines Regulation was approved by the Office of Administrative Law on October 30, 1989. It specifies which facilities are subject to the program, which substances are reported, and how those emissions are reported to the local air district. Amendments to the Guidelines Regulation, adopted by the Board in June 1990, included procedures for preparing updates to the emission inventories and reporting requirements for specific classes of facilities whose emissions of a criteria pollutant did not exceed ten tons per year (less-than-10-ton-per-year facilities). Specific sections of the regulation were amended again in September 1990, June 1991, and June 1993, to reflect additions to the list of substances that must be inventoried, and in 1993 to streamline some of the reporting requirements of the "Hot Spots" Program.

Further amendments, which significantly streamlined the reporting requirements, were approved by the Board in July 1996. The Board approved additional modifications after a public comment period in February 1997, which became effective upon approval by OAL on July 1, 1997. One of the streamlining provisions included detailed requirements that are now contained in a document entitled the Emission Inventory Criteria and Guidelines Report for the Air Toxics "Hot Spots" Program, including Appendices A through G, which has been incorporated by reference into the Guidelines Regulation. The Guidelines Regulation currently in effect is set forth in Title 17, California Code of Regulations (CCR) Sections 93300.5, and is referred to herein as the "1997 Guidelines Regulation".

The 1997 Guidelines Regulation specifies:

- the types of facilities which must report emissions of listed toxic substances;
- the timetable for submitting initial plans, inventory reports and updates;
- the information a facility operator must include in a facility's air toxics emission inventory plan, report, and update;
- source testing requirements for emission estimation, other acceptable emission estimation methods, and the reporting formats to be used; and
- the list of substances that must be inventoried.

D. Proposed Amendments to the Guidelines Regulation

Since the last update to the 1997 Guidelines Regulation, there have been significant advances in our understanding of the health information of toxic air pollutants. Most notably, diesel PM was listed as a toxic air contaminant (TAC) by ARB after an extensive review and evaluation of the scientific literature by OEHHA. (ARB 1998) Diesel PM is by far the most important known TAC and contributes over 70 percent of the estimated inhalation risk from air toxics today. In October 2000 ARB approved the "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles" (Diesel Risk Reduction Plan) which initiated a multi-year effort to reduce exposures from diesel PM throughout the State. (ARB, October 2000) The Diesel Risk Reduction Plan established the goal of reducing diesel PM emissions and the associated cancer risk by 85 percent by 2020. Pursuant to the Diesel Risk Reduction Plan, ARB has adopted several ATCMs to reduce diesel PM, including an ATCM for stationary diesel engines, which was adopted in 2004.

The primary purpose of the proposed amendments to the Guidelines Regulation is to update the "Hot Spots" Program to align it with regulations already in place, and incorporate by reference the OEHHA Health Risk Assessment Guidelines that are already being used by the districts. This update reflects our new understanding of the toxicity of diesel PM, and harmonizes the "Hot Spots" Program with the stationary engine ATCM and the proposed amendments to the ATCM related to in-use stationary diesel engines used in agricultural operations. The 2006 amendments add a new chapter on diesel engine reporting requirements, and other minor revisions and clarifications to bring the Guidelines Regulation up to date. Otherwise, the majority of the Guidelines Regulation is unchanged.

The stationary engine ATCM established emission standards and reporting requirements for stationary diesel engines operating in California. Implementation of the ATCM will result in reduced diesel PM exposures from the operation of stationary diesel engines throughout California. However, for facilities with multiple diesel engines, residual risk at the facility may still be significant even after compliance with the ATCM. For this reason, amendments are being proposed to the Guidelines Regulation that will leverage the risk reduction and reporting that is already occurring under the ATCM, and ensure that any significant residual risk is addressed through the "Hot Spots" Program. In addition, as mentioned previously, the ATCM is currently being amended to include requirements for in-use agricultural engines. The proposed amendments to the ATCM will result in an inventory of agricultural engines in the State and the emissions from agricultural engines will be significantly reduced. Amendments to the Guidelines Regulations are needed to align "Hot Spots" with these new requirements in the ATCM to minimize duplicative requirements, and to minimize regulatory burdens.

It is also necessary to update the Guidelines Regulation to incorporate new risk assessment guidelines and health values that have been developed since the Guidelines Regulation was last updated in 1997. The proposed amendments will incorporate all five parts of the OEHHA Health Risk Assessment Guidelines which include guidance for conducting health risk assessments, and the Consolidated Table of OEHHA-Approved Health Values, which contains updated health values for air toxics. All of these documents are incorporated by reference in Appendix G of the Guidelines Regulation. The list of substances in Appendix A-I of the Guidelines Regulation is also being updated to reflect new information.

E. Public Outreach and Environmental Justice

Any regulatory effort by ARB is undertaken in a full public process. Below we describe the public outreach conducted to obtain input and consultation on the proposed amendments, as well as a discussion of how the proposed amendments relate to ARB's Environmental Justice Policies.

Public Outreach

In 2003, ARB staff began discussions with stakeholders exploring ways to align the Guidelines Regulation with the stationary diesel engine ATCM. The intent was to harmonize the two programs to minimize duplicative requirements for affected facilities, and to ensure that efficient and coordinated requirements were clearly stated in both programs. Workshop participants were made aware of both the ATCM and AB 2588 "Hot Spots" requirements. The proposed amendments to the Guidelines Regulation were then revised to reflect comments received from stakeholders. In addition, ARB staff conducted three public workshops during 2006 that focused on the proposed amendments to the Guidelines Regulation. Over 2,000 participants were notified via ARB's email list serve about the proposed amendments. The list serve is composed of individuals, groups, organizations, and agencies that had expressed

interest in the "Hot Spots" Program or the stationary diesel engine ATCM, and includes representatives of business, hospitals, universities, military bases, public utilities, oil companies, and environmental groups. ARB staff also responded to phone and email inquires regarding the proposed amendments, and met individually with stakeholders upon request.

ARB staff has had numerous discussions with the CAPCOA Toxics and Risk Managers Committee, and the CAPCOA Board has discussed these proposed changes to the Guidelines Regulation. ARB staff also met with stakeholders, including several community groups, at the South Coast Air Quality Management District regarding district public notification procedures and risk assessment requirements.

Environmental Justice

Environmental Justice is defined 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. ARB's Environmental Justice Policies are intended to promote the fair treatment of all Californians and cover the full spectrum of ARB's activities.

The proposed amendments to the Guidelines Regulation are consistent with the environmental justice policy to reduce health risks from toxic air contaminants in all communities, including low-income communities, and communities of color. The proposed amendments will ensure that potential risks from diesel engines are evaluated and mitigated where necessary. These amendments will provide air quality benefits for all Californians, particularly those residing in communities located near facilities in the "Hot Spots" Program. The proposed amendments to the "Hot Spots" Program also help to address community concerns about diesel emissions in communities, and cumulative risk from multiple sources of air toxics. The Guidelines Regulation determines which types of facilities must report their emissions, what information is provided to the public about air toxics, and the timeframe for that reporting. ARB staff is committed to providing guidance to the districts on which sources are covered by the proposed amendments to the Guidelines Regulation, and how the risk from diesel PM in communities is being addressed.

The "Hot Spots" Program is unique in that it considers emissions across the entire facility when evaluating risk, rather than relying on emission reductions by specific source categories (like stationary engines, boilers, or chrome plating tanks). In that respect, the "Hot Spots" Program provides a critical backstop to many other State and district toxics programs that protects nearby receptors from residual risk from sources that are not sufficiently controlled. Although the "Hot Spots" Program can be costly for some large industrial facilities, it protects individuals from the cumulative emissions of multiple sources at a single facility. This Program provides public right-to-know information about significant air pollution health risks posed by sources of pollution in communities. This ensures that facilities evaluate their entire facility, rather than taking a piecemeal approach to emission reductions.

II. DISCUSSION OF RECOMMENDED AMENDMENTS

In Chapter II, the proposed amendments to the Guidelines Regulation are described. This chapter begins with a general summary of the proposed amendments, followed by a more detailed description of the proposed amendments and the basis for each amendment. This chapter is intended to satisfy the requirements of Government Code Section 11343.2, which requires that a non-controlling "plain English" summary of the regulation be made available to the public. The actual language for the proposed amendments is presented in Appendix C of this staff report in strike-out underline format.

A. Summary of Proposed Amendments to the Guidelines Regulation

Amendments are being proposed to the Guidelines Regulation to reflect the identification of diesel PM as a TAC, and to harmonize "Hot Spots" requirements with the air toxic control measure (ATCM) for stationary diesel engines. This is being done to avoid duplicative requirements, and to ensure that potential risks from diesel engines are evaluated and mitigated where necessary. To this end, the proposed amendments include augmenting the current reporting threshold for diesel engines, along with provisions to streamline the reporting and risk evaluations for diesel engines that leverage the reporting and risk reductions that are occurring with implementation of the ATCM.

The proposed amendments also include incorporation of revised OEHHA Health Risk Assessment Guidelines, including updated health values. The proposed amendments also include updates to the list of substances to reflect new information. Table II-1 provides a brief summary of the proposed amendments. Additional details and explanations for the amendments are provided in the following sections of this chapter.

B. Diesel Engine Provisions

To reflect the identification of diesel PM as a TAC, and to ensure "Hot Spots" requirements are fulfilled, the proposed amendments incorporate three basic modifications to the Guidelines Regulation. The first is a modification to the reporting threshold for diesel engines. This modification is needed to ensure that emissions from diesel engines that result in potential exposures to nearby receptors are brought into the "Hot Spots" Program and properly evaluated. The second is the inclusion of procedures to specify how diesel engines should be evaluated under "Hot Spots" in light of the inventory and risk reduction activities that are already occurring under the ATCM. The third is the addition of several new definitions to ensure clarity in the procedures, and consistency with the existing ATCM for stationary diesel engines. In this section, we provide details of these proposed changes.

Table II-1: Summary of Proposed Amendments to the Guidelines Regulation

Guidelines Regulation Element	Proposed Amendments
Requirements for Diesel Engines	• Create new Section XI that specifies "Hot Spots" requirements for diesel engines. • Augment existing 3,000 gallon diesel fuel reporting threshold with an additional 20 engine hours per year total at a facility reporting threshold for diesel engines. • Establish a "diesel-engine only" classification, which can be used as a basis for streamlining reporting requirements and fees. • Incorporate definitions for diesel engines, emergency use and others that are consistent with the ATCM for stationary diesel engines. • Align reporting requirements with those in the ATCM. • Assess State fees for "diesel engine only" facilities at the State rate for industrywide facilities.
Risk Assessment Guidelines	• Incorporate OEHHA Risk Assessment Guidelines that contain updated health values, including the cancer potency for diesel PM.
Substances Subject to the Program	• Update Appendix A-I with new substances. • Specify that only *respirable* crystalline silica should be reported. • Expand classes of listed substances to include individual species. • Adjust reporting levels (degree of accuracy) to reflect new health values.
Appendix E Source Categories	• Clarify that thermal spraying is subject to reporting.

1) **Diesel Engine Reporting Threshold**

We are proposing to include a new reporting threshold for diesel engines that will require reporting of emissions for facilities where any number of diesel (compression ignition or CI) engines operate in excess of 20 hours per year total at the facility. This new reporting threshold for diesel engines is included in Appendix E of the proposed amendments to the Guidelines Regulation.

Under the 1997 Guidelines Regulation, facilities with diesel engines must meet "Hot Spots" requirements if the facility uses more than 3,000 gallons per year of diesel fuel (crude, residual, distillate, or diesel oil). This reporting threshold was based on speciated diesel exhaust (primarily benzene), rather than the cancer potency factor for diesel PM which was not defined at the time the original threshold was established. Many diesel engine operators, particularly those with emergency standby engines, have not been subject to the "Hot Spots" requirements because of this usage requirement. In August 1998, ARB approved the listing of diesel PM as a TAC, and the Scientific Review Panel concluded that a value of 3×10^{-4} $(ug/m^3)^{-1}$ is a reasonable estimate of unit risk from diesel-fueled engines. (ARB, 1998)

With the approval of this unit risk factor (cancer potency factor), the current "Hot Spots" threshold for diesel engines of 3,000 gallons per year of diesel fuel was found to no longer be health protective. This triggered a proposed revision to the reporting threshold to ensure that the threshold was health protective.

The proposed 20 hrs/yr reporting threshold ensures that most, if not all, diesel engines with potential significant risk will be subject to review under the "Hot Spots" Program. Facilities that operate their engine(s) for 20 hrs/yr or less are generally low-risk, based on a conservative screening assessment performed during the development of the stationary diesel engine ATCM. (ARB, September 2003) By adopting the 20 hour/year reporting threshold used in the ATCM, the reporting requirements for the two programs are aligned to the greatest extent possible.

Under the proposed amendments, the existing 3,000 gallon per year diesel fuel reporting threshold in Appendix E of the Guidelines Regulation will be retained and still apply for facilities that operate external combustion sources, like diesel-fueled turbines and boilers. These emissions are still required to be reported, but at this time, the speciated toxic air pollutants in the exhaust rather than the diesel PM cancer potency factor are used to determine risk. This is because the cancer potency factor was based on internal combustion, compression ignition diesel engines, and not on external combustion devices. Until more information about external combustion sources is known, risk is evaluated using the speciated toxics (like benzene), rather than the diesel PM cancer potency factor.

2) **Diesel Engine Reporting Requirements**

The proposed amendments also include the addition of procedures that specify how diesel engines should be evaluated under the "Hot Spots" Program. To incorporate the procedures, a new section, "Section XI. Diesel Engine Reporting Requirements" in the Guidelines Regulation, is being proposed. Below, we discuss the proposed reporting requirements for diesel engines that are included in Section XI.

Facilities Subject to Diesel Engine Reporting Requirements

The proposed amendments in Section XI require facilities with diesel engines subject to the Guidelines Regulation to report their emissions if:

- the facility operates any number of diesel engines for more than 20 hours per year combined total at the facility; and
- the use of any number of diesel engines is a "routine and predictable" operation at the facility; and
- the diesel engine is not defined as a vehicle or motor vehicle.

The majority of engines that will meet the above criteria will be stationary diesel engines that are already subject to the ATCM. This would include single emergency standby engines or multiple engines at a facility that operate more than 20 hours per year for maintenance and testing operations, and prime engines such as engines

used in cranes, generators, pumps, and grinders/screening units. It is important to note that engine operations during an actual emergency are not subject to reporting requirements under "Hot Spots" because emergency operations cannot meet the criteria of "routine and predictable".

With these proposed amendments, facilities that operate stationary diesel engines for more than 20 hours combined total per year may now be subject to "Hot Spots" requirements for the first time. These facilities include schools, retail stores, multi-story office buildings, hospitals, government agencies including water treatment, fire, police, courthouses, and jails, and dozens of other types of facilities with stationary diesel engines. It is important to note that the vast majority of these businesses only have one diesel engine, and will likely screen out of the process after compliance with the ATCM because of low risk. Any facility with only a single diesel engine that reduces their engine operating hours to 20 hours per year is no longer subject to the "Hot Spots" Program. The remaining facilities will be handled by the district using a streamlined facility evaluation process, which reduces compliance costs for these facilities.

Facilities with diesel engines that have previously been subject to the "Hot Spots" Program, such as refineries, power plants, and large manufacturing facilities, will be notified by the district if the facility needs to be reevaluated. When the risk from diesel engines is included in the facility's health risk assessment, the facility may be required to update their emission inventory and health risk assessment. Provisions have been added to simplify this process.

There are additional diesel engines that are not subject to the ATCM that may be subject to the "Hot Spots" Program. These include portable diesel engines and engines equal to or less than 50 horsepower (hp). The ATCM does not apply to portable engines and in-use engines equal to or less than 50 hp, but does include reporting requirements and emission standards for the sellers of new engines $\leq$50 hp.

Portable diesel engines, and diesel engines equal to or less than 50 hp, that are part of "routine and predictable" operations and operate more than 20 engine hours per year combined total at a facility are subject to the "Hot Spots" Program at district discretion. Consistent with the past implementation of the "Hot Spots" Program, local districts determine what constitutes "routine and predictable" operations. Under the proposed amendments, the emissions from these engines are only required to be reported if the district determines there is good cause to expect the engines at the facility may pose a significant risk. This means low-risk activities that could be considered routine and predictable by the district are not likely to be subject to "Hot Spots" reporting requirements. It is anticipated that the district will use factors such as distance from the engine to the nearest downwind receptor, hours of operation, and the frequency and type of operations when determining what constitutes a potential significant risk.

Reporting Requirements for Facilities with Diesel Engines

Because most of the information that the district needs to evaluate facilities with diesel engines has already been submitted by facilities pursuant to the ATCM for stationary

diesel engines, the proposed amendments specify that the district shall determine if the ATCM information is sufficient, or whether more information is necessary. For almost all facilities with diesel engines, the ATCM's reporting or registration requirements will fulfill the "Hot Spots" reporting requirements. The ATCM required information about the engine owner or operator, engine location, make, model, and horsepower of the engine, operational data such as hours of operation, engine load, and fuel usage. The ATCM and the proposed amendments to the Guidelines Regulation also request data that will help evaluate the potential risks from diesel engines, such as distance to the nearest offsite receptor, stack diameter, and diesel PM emission rate.

For stationary diesel engines, this information was required to be submitted to the districts by July 2005. As such, compliance with the ATCM has satisfied the reporting requirements under the proposed amendments for these engines. The amendments also require the districts to submit the diesel PM inventory from each facility subject to the Guidelines Regulation to ARB, and to provide, upon request by ARB Executive Officer, a list of facilities with diesel engines and their status in the "Hot Spots" Program. ARB will use this information to assess progress on the status of risk reduction.

Risk Analysis Procedures for Facilities with Diesel Engines

The proposed amendments establish a process that allows districts to conduct an initial screening health risk assessment using screening risk assessment tables to determine if a facility is potentially subject to "Hot Spots" requirements. The screening process would apply to engines at facilities where stationary diesel engines operated more than a total of 20 hours per year. If the district calculates a prioritization score for the facility and the facility prioritization score is equal to or less than one, the facility is considered low priority and is exempt from the "Hot Spots" Program (H&SC Section 44344.4). A facility with a prioritization score of 10 or less is not subject to State fees. If a screening health risk assessment or full health risk assessment for a facility indicates that the cancer risk is less than one (and the non-cancer risk is less than 0.1), the facility is not subject to the "Hot Spots" Program. A facility with a cancer risk greater than or equal to one, or a health index for non-cancer risk of greater than or equal to 0.1, may be subject to State fees and other applicable "Hot Spots" requirements.

ARB staff developed screening tables to provide districts and facilities with a tool to quickly screen out low risk facilities. The screening tables are based on a conservative generic risk assessment for stationary diesel-fueled engines and represent a range of emission rates and hours of operation bracketing a fairly broad range of possible operating scenarios. Meteorological data from West Los Angeles (1981) was used to provide meteorological conditions with lower wind speeds and more persistent wind directions, which will result in less pollutant dispersion and higher estimated risk.

The screening tables use U.S. EPA's ISCST3 air dispersion model to estimate the annual average diesel PM concentration at the point of maximum impact. The potential cancer risk was calculated following OEHHA's Health Risk Assessment Guidelines and it was assumed that the most impacted individuals 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, by the unit risk factor for diesel PM. As such, the screening tables will likely overestimate the potential risk from an engine, and are a useful tool in determining if an engine is below the risk threshold or if a more comprehensive health risk assessment is necessary. The screening tables are available on ARB's Internet site at http://www.arb.ca.gov/ab2588/diesel/diesel.htm.

The proposed amendments also allow a facility with an existing health risk assessment to request that the district recalculate a health risk assessment by adding a screening health risk assessment score for diesel PM to the current health risk assessment for the facility. If the combined risk indicates that the facility is a potential significant risk, the district may require the facility to complete a full health risk assessment. If the score indicates that the facility is not a significant risk, the health risk assessment is recalculated to reflect the diesel risk, and the facility is classified as an "Intermediate-Level" facility. The revised health risk assessment must be approved by the district.

Alternative Risk Reduction Requirements for Unique Diesel Engine Applications

There may be compelling public safety or national security reasons that make implementing risk reduction (engine retrofit or replacement) infeasible for some diesel engine applications, including military tactical support equipment, direct-drive fire pumps that must meet National Fire Protection Association (NFPA) specifications, and stationary diesel engines at nuclear power plants that are subject to the requirements of the United States Nuclear Regulatory Commission. Under the stationary diesel engine ATCM these engines were exempt from meeting the emission limits and performance standards because ARB staff found that it was not feasible to retrofit or replace these engines because of other regulatory or operational requirements that the engines must meet. Based on a review of these diesel engine applications, ARB recommends that districts adopt alternate risk reduction requirements for these categories. Options could include adjusting, delaying, or waiving risk reduction requirements for these engine applications. Other sources of toxic pollutants at the facility would still be subject to the "Hot Spots" Program and public notification, if triggered, would still be required. Additional detail and discussion on these engines is provided in Chapter IV.

Proposed Streamlined Requirements for Diesel Engine Only Classification

The proposed amendments include streamlined provisions for diesel engine-only facilities. A diesel engine-only facility is a facility where the only potentially significant source of toxic emissions are diesel engines. A diesel engine-only facility can be a facility with only diesel engines and no other sources of toxics, or it can be a facility with diesel engines and other sources of toxics provided the facility is designated as "Low-Level" (prioritization score, screening risk assessment, or health risk assessment less than one). Diesel engine-only facilities are eligible for modified requirements for inventory reporting, risk assessment, and fees. These streamlined provisions are briefly described here:

- A diesel engine-only facility that reduces operating hours for all diesel engines to less than 20 engines hours per year combined total is not subject to the Guidelines Regulation or State fees.
- State fees for diesel engine-only facilities will be assessed at the "Industrywide" facility rate ($35/year) if applicable.

Diesel Engines at Agricultural Operations

The Board will consider amendments to the stationary diesel engine ATCM to include in-use stationary diesel agricultural engines at the November 16-17, 2006, ARB public hearing. This is the same public hearing at which the proposed amendments to the Guidelines Regulation will be considered. ARB staff is proposing to delay "Hot Spots" applicability requirements for stationary agricultural diesel engines until after 2011 because the adoption of the ATCM or equivalent district rule or program sets in motion actions to reduce risks in the near future. This schedule allows engine operators five years to focus on cleaning up stationary agricultural diesel engines through the ATCM process before triggering "Hot Spots" requirements for those engines.

The ATCM contains provisions for registration of agricultural diesel engines with local air districts. This registration program, or an equivalent district program, will satisfy the "Hot Spots" emission inventory reporting requirement in most, if not all, cases. The requirements of the ATCM are also structured so that compliance with the ATCM will satisfy "Hot Spots" risk reduction requirements in most cases. In essence, the ATCM already contains the "Hot Spots" emission inventory requirement, and allows the facility to move directly to the risk reduction phase. Although not all engines will be replaced by the end of 2011, the vast majority of engines that could pose a significant risk will have been replaced, and the districts will have already ensured that new engines being installed will be below the district's risk reduction threshold.

The intent of these amendments is to ensure that there is no significant residual risk after the implementation of the ATCM or equivalent district program for stationary agricultural diesel engines. ARB, local air districts, and the agricultural industry have agreed to work together in the near-term to identify agricultural engines near schools, residences, or other sensitive sites to ensure that the risk from these engines will be reduced below district thresholds as quickly and efficiently as possible. This near-term effort will encourage agricultural operators with engines near receptors to take advantage of incentive programs available for agricultural engine electrification (Pacific Gas and Electric's Agricultural Internal Combustion Engine Conversion Inventive Program and Southern California Edison's Time-of-Use Pumping Agricultural Internal Combustion Engine Program) or the Carl Moyer Program. In this way, growers will comply with both the proposed ATCM, and "Hot Spots".

3) **Supporting Definitions for Diesel Engine Reporting Requirements**

Eleven definitions are proposed for inclusion in the Guidelines Regulation to help clarify and enforce the requirements and to ensure harmonization with the ATCM. Whenever

possible, the same definition that is used in the ATCM is proposed for the Guidelines Regulation. A list of the 11 definitions are provided in Table II-2.

Table II-2: Definitions Proposed for Inclusion in the Guidelines Regulation

Agricultural Operations
Approach Light System with Sequenced Flasher Lights in Category 1 and Category 2 Configurations
Diesel Engine or Compression Ignition (CI) Engine
Diesel Engine-Only Facility
Diesel Particulate Matter
Emergency Operations
Emergency Use
Maintenance and Testing
Portable Diesel Engine
Routine and Predictable
Stationary Diesel Engine ATCM

C. OEHHA Health Risk Assessment Guidelines

The "Hot Spots" Act requires that health risk assessments be prepared in accordance with guidelines established by OEHHA. OEHHA has adopted new Health Risk Assessment Guidelines since the Guidelines Regulation was last updated in 1997. The proposed amendments will incorporate by reference the OEHHA Health Risk Assessment Guidelines, which include: *Part I. The Determination of Acute Reference Exposure Levels for Airborne Toxicants; Part II. Technical Support Document for Describing Available Cancer Potency Factors; Part III. The Determination of Chronic Reference Exposure Levels for Airborne Toxicants; Part IV. Exposure Assessment and Stochastic Technical Support Document: and the Air Toxics "Hot Spots" Program Guidance Manual for Preparation of Health Risk Assessments (2003).* These documents have superseded the CAPCOA Risk Assessment Guidelines (1992), and are already in routine use by air districts.

D. Updated Substances and Health Values

The amendments propose updating substances listed in Appendix A-I of the Guidelines Regulation. H&SC Section 44321 requires ARB to compile and maintain a list of substances that are recognized as presenting a chronic or acute threat to public health in designated lists of substances compiled by federal and State regulatory programs referenced in the statute. The statute also gives the Air Resources Board authority to include any additional substances recognized by the Board as presenting a chronic or acute threat to public health when present in the ambient air. The staff has reviewed the lists referenced in H&SC Section 44321 and the list of substances subject to emission reporting under the federal Title III, Section 313 of the Superfund

Amendments and Reauthorization Act (SARA 313), also known as the federal Toxics Release Inventory (TRI) substances. As a result of this review, ARB staff is proposing adding new substances and modifying existing substances to the list and updating health values for some substances already on the list. The proposed modifications are discussed below and summarized in Table II-3.

New and Modified Substances

ARB is required to compile and maintain a list of substances that reflect substances of concern identified by other agencies and scientific bodies. Currently, substances may be added to "Hot Spots" from ARB's own list of TACs, EPA list of Hazardous Air Pollutants (HAPs), International Agency for Research on Cancer (IARC), California's 1986 Proposition 65 (Prop 65), National Toxicology Program (NTP), Hazard Evaluation System and Information System (HESIS), and any other substances identified by ARB as causing concern to public health.

ARB staff evaluated the substances that have been added to the lists specified in the Health and Safety Code since the "Hot Spots" Guidelines Regulation was last updated. Staff of ARB and OEHHA reviewed the available information regarding manufacturing, use, and health effects of the substances. Based on the review, nine new substances are being proposed to be added to the Appendix A-I list of substances (substances for which emissions must be quantified). For several compounds minor changes are being proposed including corrections to Chemical Abstracts Service (CAS) numbers or correction to chemical nomenclature. For several classes of compounds, the individual substances belonging to those classes are being listed because new health values have been developed for them.

All but two of these substances have OEHHA-approved health values and are already being included in new health risk assessments for cancer and non-cancer effects. The remaining two substances (PBDEs and PFOA), have been found to bioaccumulate in humans, and are being proposed for inclusion in the list of substances. Only a very small number of facilities are likely to emit these two substances, but the emissions information will be useful for ARB to track these two persistent, bioaccumulative, and toxic substances.

Substances that have OEHHA-adopted health values, and that belong to classes of substances currently included in Appendix A of the Guidelines Regulation, are proposed to be added to Appendix A-I. This includes 11 dioxin-like PCBs, and several other toxics, as shown in Table II-3. More information about additional substances that are still being considered for addition to Appendix A is available at: http://www.arb.ca.gov/ab2588/substances.htm. This includes substances already reported to US/EPA as part of the Toxic Release Inventory reporting requirements.

Table II-3: Updates to List of Substances

New Substances	1) Bromine pentafluoride 2) t-Butyl acetate 3) Hydrogen bromide 4) Hydrogen selenide 5) Oleum 6) Polybrominated diphenyl ethers (PBDEs) 7) Perfluorooctanoic acid (PFOA) and its salts and derivatives 8) Sulfur trioxide 9) Vanadium pentoxide
Specific Substances Added to Chemical Group Already Listed	1) 2-Chlorophenol 2) 4-Nitropyrene 3) 3,3',4,4'-Tetrachlorobiphenyl (PCB 77) 4) 3,4,4',5-Tetrachlorobiphenyl (PCB 81) 5) 2,3,3',4,4'-Pentachlorobiphenyl (PCB 105) 6) 2,3,4,4',5-Pentachlorobiphenyl (PCB 114) 7) 2,3',4,4',5-Pentachlorobiphenyl (PCB 118) 8) 2,3',4,4',5'-Pentachlorobiphenyl (PCB 123) 9) 2,3,3',4,4',5-Hexachlorobiphenyl (PCB 156) 10) 2,3,3',4,4',5'-Hexachlorobiphenyl (PCB 157) 11) 2,3',4,4',5,5'-Hexachlorobiphenyl (PCB 167) 12) 3,3',4,4',5,5'-Hexachlorobiphenyl (PCB 169) 13) 2,3,3',4,4',5,5'-Heptachlorobiphenyl (PCB 189) 14) Tetrachlorophenols 15) Trimethylbenzenes
Added from Appendix A-II*	1) N-Nitrosodiphenylamine 2) 5-Nitroacenaphthene
Changes to CAS Numbers or Chemical Name	1) Cyanide compounds 2) Hexachlorocyclohexanes 3) Nickel carbonate 4) Toluene diisocyanates 5) Xylenes 6) 1,2,3,4,6,7,8,9-Octachlorodibenzofuran
Adjustment of Particle Size for Reporting	1) Silica, respirable crystalline

*These substances were required to be reported in the past but now must be quantified as part of the emission inventory because health values are now available.

The degree of accuracy for each new substance was calculated such that a prioritization score based on those emissions would be approximately one. This ensures that toxics are reported to a level that is health protective. A facility that emits a toxic in an amount that is less than one-half the degree of accuracy is ensured that those emissions will not contribute to the risk at the facility.

Part of the CAPCOA Risk Assessment Guidelines (1992) includes chronic reference exposure levels (RELs) for substances that do not have an OEHHA-approved health value. Because the CAPCOA document is being replaced by the OEHHA Health Risk Assessment Guidelines, approximately 40 substances will no longer be used to calculate chronic risk. After reviewing 2001-2004 facility inventories, ARB staff found that these substances very rarely contribute to the overall chronic risk at facilities. In cases where a chronic risk could be significant, the cancer risk predominated.

Substances with Updated Health Values

The Office of Environmental Health Hazard Assessment (OEHHA) has updated many of the health values (chronic and acute reference exposure levels (RELs) and cancer potencies) for substances required to be reported under the AB 2588 "Hot Spots" Program. These health values are listed in the April 2005 Consolidated Table of OEHHA / ARB Approved Health Values, incorporated by reference in Appendix G of the proposed amendments to the Guidelines Regulation. Most of the new health values impact a small number of facilities, because most facilities do not emit those substances, and most of these changes will not trigger additional requirements for facilities. In fact, most of the health values are already being used by facilities and districts in facility prioritization scores and health risk assessments with little recognized effect on facility program requirements. Diesel PM is unique in that so many facilities are impacted by the new cancer potency for diesel PM.

E. Miscellaneous Revisions

The staff proposes a number of other clarifications and minor revisions that clarify the intent of the Guidelines Regulation and reflect updated information.

Clarification to Appendix E to Include Thermal Spraying

There are approximately 37 facilities that conduct thermal spraying in California. All of these facilities are subject to ARB's Thermal Spraying ATCM (Section 93102.5, Title 17, California Code of Regulations), adopted by the Board in 2004. According to Appendix E of the regulation, facilities where "...miscellaneous plating, polishing, coating, engraving, and allied services, if using hexavalent chromium, nickel, or cadmium" are subject to the regulation. Thermal spraying can emit hexavalent chromium, but the hexavalent chromium is formed during the spraying process and is not a component of the materials being used. However, because the original intent was to evaluate facilities that emit hexavalent chromium, and many districts interpreted the Appendix E provision to include thermal spraying, ARB is proposing to explicitly include thermal spraying in the definition. This will have a negligible impact on both new and existing facilities because ARB's thermal spraying ATCM already addresses the risk at these facilities.

Other Revisions

Several minor revisions to reporting requirements for non-diesel sources are also included in the proposed amendments, such as providing for electronic submittals of inventory data. In addition, other minor revisions are being proposed to clarify the original language to ensure consistency in interpreting and complying with the regulation.

III. ECONOMIC AND ENVIRONMENTAL IMPACTS

A. Economic Impacts

In this chapter, we provide the estimated costs to businesses and public agencies to comply with the proposed amendments to the Guidelines Regulation. The potential economic impacts on California businesses are also evaluated. This analysis does not include the costs associated with complying with elements of the "Hot Spots" Program not being amended, other ATCMs, or other regulations that may affect facilities subject to the amendments.

It is important to note that while some facilities may incur additional costs due to the proposed amendments to the Guidelines Regulation, this is not a function of adding new requirements to the Program. Rather, the additional costs reflect a better understanding of the impacts of toxic air emissions on public health. The proposed amendments reflect this new health information which has been compiled since the last update to the 1997 Guidelines Regulation. The primary effect of this new information will be that the health risk posed by certain types of toxic emissions may now trigger "Hot Spots" requirements at facilities. The proposed amendments to the Guidelines Regulation do not change the inventory reporting, public notification, and risk reduction requirements, which form the basis of the "Hot Spots" Program. Only the reporting threshold for facilities with diesel engines, the emission inventory format, updates to risk assessment guidelines, and the list of substances are proposed to be amended. In the following sections, we provide a summary of the costs and the legal requirements that must be satisfied in analyzing the economic impacts to businesses.

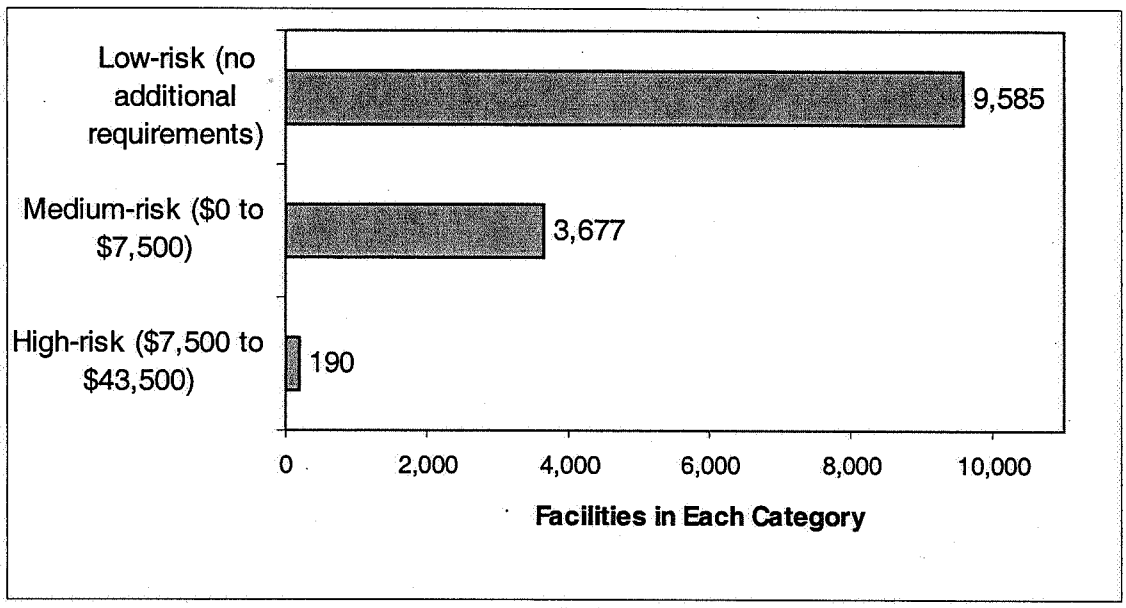
B. Summary of the Costs and Economic Impacts

We estimate the total costs associated with the proposed amendments to the Guidelines Regulation for facilities to be approximately $8.1 million. This corresponds to approximately $2 million dollars annually for four years in the 2007 through 2010 timeframe. The majority of these costs will be borne by facilities with diesel engines that are now subject to "Hot Spots" and have significant residual risk even after compliance with the ATCM. A smaller portion of the costs, about $1 million, will be incurred by facilities that emit substances that have new health values where the emissions of these substances trigger new reporting and health risk assessment requirements.

The cost for a business will likely depend on the number of diesel engines at a facility, the residual risk that remains after compliance with the ATCM, and whether the facility emits other toxics with new health values that trigger additional "Hot Spots" requirements. To determine the cost to a typical business with diesel engines, we used engine information that was submitted to the district pursuant to the reporting requirements in the ATCM. Using this information and estimates of costs associated with compliance with "Hot Spots" (inventory reporting, health risk assessment, State and district fees, and risk reduction), we estimated costs for facilities based on the number of engines at the facility.

A distribution of estimated facility costs is shown in Table III-1, which summarizes the costs for facilities with stationary diesel engines to comply with the proposed amendments to the Guidelines Regulation. These facilities include businesses, publicly owned facilities, and other government facilities.

Table III-1: Distribution of Estimated Facility Costs



Source: Estimates based on available information, and reported engine information from facilities complying with the stationary diesel engine ATCM.

Low-risk facilities include single-engine facilities, and facilities with no additional requirements. Medium-risk facilities include facilities with risks between one and 10 per million, which include facilities that have conducted health risk assessments and determined that their risk is not significant. High-risk facilities include facilities with risks greater than 10 per million. High-risk facilities conduct public notification, and it was assumed that 80 of those facilities would be required to reduce their risk below the district's risk reduction threshold. The underlying cost assumptions and other details are provided in Tables D-1, D-2, D-3, and D-4.

California businesses are affected by the estimated costs of the proposed amendments to the extent that the implementation of the proposed amendments reduces their profitability. Overall, most affected businesses will be able to absorb the costs of the proposed amendments with no significant adverse impacts on their profitability. This finding is based on the staff's analysis of the estimated change in "return on owner's equity" (ROE).

The analysis found that the overall change in ROE ranges from negligible to a decline of about eight percent. Generally, a decline of more than ten percent in ROE suggests a significant impact on profitability. Because the proposed amendments would not

significantly alter the profitability of most businesses, we do not expect a noticeable change in employment, business creation, elimination, or expansion, and business competitiveness in California.

All the cost estimates provided in this chapter are relative to the year 2006 (current value of the costs), and all costs are given in 2006 dollars. The information, assumptions and methodologies used to determine compliance costs are summarized in this chapter. Supporting information is provided in Appendix D of this staff report.

C. Legal Requirements

Section 11346.3 of the Government Code requires that, in proposing to adopt or amend any administrative regulation, State agencies shall assess the potential for adverse economic impacts on California business enterprises and individuals, including the ability of California businesses to compete with businesses in other states. This economic impact analysis is based on a comparison of the "return on owners' equity" (ROE) for affected businesses before and after the inclusion of the amendments. The assessment shall also include the potential impact of the regulation on California jobs; business expansion, elimination or creation; and the ability of California business to compete with businesses in other states.

Also, State agencies are required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. The estimate shall include any non-discretionary cost or savings to local agencies, and the cost or savings in federal funding to the State.

Moreover, H&SC Section 43013(c) prohibits regulatory actions affecting nonvehicular engines (e.g. stationary diesel engines) used in agricultural operations unless ARB determines that the standards and other requirements are necessary, cost-effective, and technologically feasible for such engines.

Finally, H&SC Section 57005 requires ARB to perform an economic impact analysis of submitted alternatives to the proposed regulation before adopting any major regulation. A major regulation is defined as a regulation that will have a potential cost to California business enterprises in an amount exceeding ten million dollars in any single year. Because the estimated cost of the proposed amendments to the Guidelines Regulation do not exceed ten million dollars in a single year, the proposed regulation is not considered a major regulation.

The following is a description of the methodology used to estimate costs, as well as ARB staff's analysis of the economic impact on California businesses and State and local agencies.

D. Methodology for Estimating Costs

In this section, we describe how we estimated the costs associated with the proposed amendments. Cost estimates were developed for facilities with diesel engines and for

facilities that emit substances other than diesel that have new health values such as crystalline silica, acrolein, and naphthalene. Briefly, the methodology for estimating costs for facilities with diesel engines entailed:

- Estimating costs associated with "Hot Spots" including the costs for inventory reports and updates, health risk assessments, public notification, risk reduction, and State and district fees;
- Estimating the number and distribution of facilities with one engine, two engines, three to four engines, and five or more engines using the data reported pursuant to the ATCM;
- Identifying the "Hot Spots" Program costs for facilities with diesel engines taking into account expected compliance with the ATCM, need for additional evaluations under "Hot Spots" and assumptions on residual risk; and
- Applying the appropriate costs to the number of facilities within each engine category (one engine, two engines, three to four engines, or five or more engines) that are expected to implement various "Hot Spots" requirements applicable to those facilities.

For facilities that emit substances with new health values we:

- Estimated the costs associated with "Hot Spots" including emission inventory reporting, health risk assessment, and source testing requirements;
- Determined the number of facilities that emit naphthalene, crystalline silica, or acrolein at levels that could potentially trigger additional "Hot Spots" requirements from a review of facility data in the California Emissions Inventory Database and Reporting System; and
- Applied the appropriate "Hot Spots" costs to the number of facilities identified.

In addition to estimating the costs for facilities with diesel engines and for facilities that emit substances with new health values, we discuss the potential costs to the districts, and the State (ARB and OEHHA) of implementing the proposed amendments to the Guidelines Regulation.

E. Estimated Costs for Compliance

Facilities with Diesel Engines - Estimated Costs for "Hot Spots" Program Activities

Table III-2 provides a summary of the range of potential costs for each of the "Hot Spots" Program requirements. These estimates are based on discussions with district staff, facility operators, and environmental consultants, and represent the low and high cost estimates. In our cost analysis, we estimated a typical cost for an average facility which was within the range of the costs presented in Table III-2. It is likely that some complex facilities may have higher costs than those represented in this chapter. A more detailed list of potential "Hot Spots" Program costs associated with the proposed amendments is presented in detail in Appendix D of this staff report.

Table III-2: Estimated Costs for "Hot Spots" Program Activities

Activity Required by "Hot Spots"	Range of Costs for Facilities with Diesel Engines	
	Low-Risk Estimate ($)	High-Risk Estimate ($)
Prepare Inventory Plan and Report or Update	0 - 500	1,500
Conduct Health Risk Assessment	0 - 2,500	1,000 - 20,000
Conduct Public Notification	0 - 1,000	1,000 - 20,000
Conduct Risk Reduction	0 - 1,000	30,000*
Pay State and District Fee	0 - 35	4,000 - 8,000
Combined Totals**	0 to $5,035	$37,500 to $78,000

*The facility cost includes the replacement of a single diesel engine (~250 hp). Some facilities may have to replace more than one engine, or replace an engine that is much larger, which will increase the costs for risk reduction.

** For a small number of facilities, additional costs may accrue from activities such as conducting source testing. Although most facilities are not required to conduct source testing, costs for source tests can range from $8,000 to $80,000, with additional costs and district fees for observing and reviewing source tests. Because the ATCM was structured to minimize the need for source testing by allowing other information such as engine manufacturer's data and emission test data from similar engines to demonstrate engine emission rates, we did not include any costs associated with source testing in our estimates.

Number of Facilities and Distribution of Diesel Engines

To estimate the number of facilities with diesel engines, and to determine the number of diesel engines at each facility, we relied on the diesel engine data reported to the districts pursuant to the stationary diesel engine ATCM. At the request of ARB staff, several districts provided information on 12,600 of the estimated 21,000 stationary diesel engines in operation statewide. The 12,600 engines are at about 8,100 different facilities, which represent about 60% of the statewide total, and we believe this population is a representative sample of all facilities with diesel engines.

Facilities operating stationary diesel engines were broken down into four categories as shown in Table III-3. These categories were selected because they represent natural breaks in the data, and we anticipate that facilities within these categories would be subject to similar costs from the proposed amendments.

Table III-3: Distribution of Facilities with Stationary Diesel Engines from Data Submitted to ARB by Districts

	# of Engines	# of Facilities
	1	6,390
	2	920
	3 or 4	495
	5 or more	267
Total	**12,600**	**8,072**

Assuming that the diesel engine data is representative of the overall distribution of diesel engines, the estimate of the projected distribution of facilities statewide based on an estimated statewide stationary diesel engine population of 21,000 is shown in Table III-4.

Table III-4: Projected Statewide Distribution of Facilities Operating Stationary Diesel Engines Assuming a Statewide Inventory of 21,000 Stationary Diesel Engines

	# of Engines	# of Facilities (Adjusted)	% of Facilities
	1	10,650	79.2
	2	1,533	11.4
	3 or 4	825	6.1
	5 or more	444	3.3
Total	**21,000**	**13,452**	

The distribution may have an inherent bias towards a higher percentage of large facilities given that most of the largest facilities, like military bases, universities, and other publicly-owned facilities, are likely to have already submitted engine information to the local air district. Smaller businesses with single emergency standby (backup) diesel engines are less likely to have submitted data, and in some cases are just beginning to be subject to district permit programs. Therefore, because the costs increase for facilities with more diesel engines, the analysis may overestimate the total compliance costs for facilities in California.

Facilities with Diesel Engines - Estimated Program Costs

In the following discussion, ARB staff provides cost estimates for each of the four facility categories. As mentioned previously, ARB staff used information gathered from several different sources when estimating compliance costs for facilities and the percentage of facilities that would be subject to specific program requirements. Many district staff provided a range of costs for various program requirements, and ARB staff

spoke with facility operators and consultants when estimating the numbers of facilities that may fall into each facility category and the costs associated with those categories.

A key determinant of a facility's compliance costs with the proposed amendments is the number of affected diesel engines at a facility. Most facilities with one emergency standby (backup) engine will have virtually no cost due to these amendments, because compliance with the stationary diesel ATCM will satisfy the "Hot Spots" requirements. Facilities that are located far from receptors also will likely comply with "Hot Spots" requirements because the risk from the facility will likely be low. Facilities like military bases and other large facilities with engines spread out over a large geographic area also tend to have lower risk. The risk is based on the relative location of each of the engines within the facility to nearby receptors. Facilities with multiple engines in populated areas may have additional "Hot Spots" costs depending on the number of engines, type(s) of engines, and the proximity of receptors.

For each of the four categories (one engine, two engines, three to four engines, or five or more engines), ARB staff estimated how many facilities in each category would likely be subject to additional "Hot Spots" program requirements, what program elements would need to be addressed, and how much those activities are likely to cost. ARB staff also estimated how many facilities in each category are likely to comply with "Hot Spots" (low-risk), and how many facilities are likely to incur additional requirements (high-risk). A summary of our assumptions used to apply the various cost elements is provided in Table III-5, and additional details are provided in Appendix D of this staff report.

Using the assumptions provided in Table III-5, and applying them to the engines in each facility category where the assumption is applicable, we estimated the total costs for compliance with the proposed amendments. As shown in Table III-6, the total cost of the proposed amendments for facilities with stationary diesel engines is estimated to total approximately $7.2 million dollars over 4 years.

We believe that these cost estimates represent an upper bound for most facilities. However, some facility costs could be higher than those in this analysis if the facility emits several new substances, or operates multiple high-emitting diesel engines near receptors.

Table III-5: Cost Assumptions for Facilities with Stationary Diesel Engines

Facility Category	Lower-Risk Facility	Average Cost	Higher Risk Facility	Average Cost* (Range of Costs)
1 Engine (10,650 Facilities)	8,520 facilities exempt from "Hot Spots"	$0	1,065 facilities only subject to fees	$235
2 Engines (1,533 Facilities)	1,226 facilities only subject to fees	$235	307 facilities conduct simplified health risk assessment, 40 facilities conduct public notification, 15 facilities reduce risk by replacing an engine	$3,631 ($2,035 to $33,035)
3 or 4 Engines (825 Facilities)	495 facilities only subject to fees	$335	350 facilities conduct a health risk assessment, 50 facilities conduct public notification, and 25 facilities reduce risk by replacing an engine	$5,470 ($500 to $39,500)
5 or More Engines (444 Facilities)	222 facilities pay fees	$500	222 facilities conduct a health risk assessment, 100 facilities conduct public notification, and 50 facilities reduce risk by replacing an engine	$15,608 ($1,500 to $43,500)

* The average cost was calculated by adding all of the costs for each facility category, and dividing that amount by the number of facilities in that category.

Table III-6: Summary of Total Costs for Four Facility Categories

Facility Category	Number of Facilities	Total Cost	Average Cost
Facility with 1 engine	10,650	$250,275	$24
Facility with 2 engines	1,533	$1,402,855	$915
Facility with 3-4 diesel engines	825	$1,970,825	$2,389
Facility with 5 or more diesel engines	444	$3,576,000	$8,054
Grand Total	13,452	$7,199,955	$535

Facilities that Emit Substances with New Health Values

Facilities that emit crystalline silica, acrolein, or other substances that have new health values, may be subject to new reporting requirements, including possible source testing

and health risk assessment requirements. In addition, some facilities will need to update their health risk assessment because their risk assessment may not adequately reflect the current risk at the facility. This is particularly important for facilities with diesel engines, but may also impact other facilities that emit substances with new health values, like naphthalene, or emissions of newly listed substances, like vanadium pentoxide.

As has been the case in previous years during the implementation of the "Hot Spots" Program, new information becomes available which increases our awareness of the toxicity of substances. This information can trigger new reporting requirements and risk assessments for businesses that use or emit these substances. In some cases, test methods are not available, and the facility may be responsible for estimating emissions using experimental methods, or other emission inventory estimation methods. These efforts will be coordinated by both ARB and districts, and, to the greatest extent possible, allow businesses to use default screening (health protective) emission factors whenever possible. For most cases, ARB staff recommends that local air districts consider postponing emission reporting requirements for these substances until an adequate test method is identified. At that time, districts will have the option of evaluating existing emission factors and source test options, in order to help the facility estimate emissions.

Because a generally accepted source test method is still under development, businesses that handle materials that contain crystalline silica, like sand and gravel operations, or businesses that emit acrolein as part of their combustion processes may be asked to participate in the development of source test methods or emission factors until test methods have been identified. Average compliance costs for a facility that emits any newly listed substance or substance with a new health value may not reflect the actual costs for facilities that emit large amounts of the substance in close proximity to sensitive receptors such as residences. In addition, these facilities are much more likely to be required to update their emission inventory. For these facilities, compliance costs may exceed $20,000. For most facilities that emit a newly listed substance (or one with a new health value), an emission inventory update by the facility, and a reprioritization by the district, are likely to have low financial costs.

In order to estimate how many facilities may be impacted by the new health value for naphthalene and crystalline silica, the revised health value for acrolein, and the inadequacy of the source test methods for crystalline silica and acrolein, staff relied on previously reported emissions data. We assumed that facilities that emitted more than 300 lbs/yr of naphthalene, 1,000 lbs/yr of crystalline silica, or 25 lbs/yr of acrolein may be potentially subject to additional "Hot Spots" requirements and associated costs.

The number of affected facilities and the estimated costs for facilities that emit these substances are listed in Table III-7. Because these three substances have a significant potential to trigger additional "Hot Spots" requirements, these cost estimates represent the highest average cost for a facility that emits a newly listed substance, or a substance with a new health value.

Table III-7: Estimated Average Facility Costs for Three Substances

	Naphthalene	Crystalline Silica	Acrolein
Estimated additional costs for an average facility that emits the listed substance:	$2,500	$6,000	$4,000
Estimated number of facilities that emit the listed substance in quantities that may require an updated emission inventory or health risk assessment, and possibly additional fees and other requirements:	35	75	100
Total estimated costs for facilities that emit the listed substance:	$87,500	$450,000	$400,000
Total estimated costs for all three substances:	$937,500		

The cost estimates in Table III-7 for naphthalene are lower because a source test is already available, and the emissions have already been estimated and reported by facilities that emit naphthalene. The cost estimate only reflects the cost for some facilities to update their risk assessment to reflect the potency of naphthalene. The cost estimates in Table III-7 for crystalline silica and acrolein are based on staff's estimates of the cost for inventory reporting, and the shared cost to the industry for source testing and emission factor development. It is anticipated that estimating emissions of crystalline silica will be slightly more costly than for acrolein due to the nature of the processes that emit crystalline silica. A smaller number of facilities may have to conduct a health risk assessment for crystalline silica and acrolein, compared with naphthalene, and those costs are also reflected in Table III-7.

Other newly listed substances besides naphthalene, crystalline silica, and acrolein, will likely have much lower compliance costs for facilities. Unlike crystalline silica and acrolein, emission factors for these other newly listed substances are readily available for estimating emissions, which decreases compliance costs. Although these other substances may trigger inventory update requirements for a small number of facilities, in general, most facilities will be able to include these new substances with a relatively small increase in compliance costs.

F. Potential Costs for Public Agencies with Diesel Engines

Local government agencies, including cities and counties, publicly-owned utility districts, as well as the State and federal government, own and operate stationary diesel engines subject to the proposed amendments. Compliance costs for these public agencies will be similar to businesses. The diesel engine facility data submitted to the districts

indicated that publicly-owned facilities comprised a large proportion of the facilities with multiple engines. Multiple engine facilities are more likely to experience costs as a result of the proposed revisions. Based on that finding, we estimated that of the $8.1 million in compliance costs (over 4 years) for facilities subject to the proposed amendments, approximately 40%, or $3.3 million, will be borne by publicly-owned facilities.

Based on the facility data information obtained from the districts, we were not able to separate the public facilities into the different government sectors i.e. local, state, and federal. To obtain an estimate of the costs for the various government sectors, we relied on the distribution of publicly owned engines that was used for the development of the costs associated with the ATCM.[1] We assumed that the costs for an individual government sector is proportional to the contribution of the engines in that sector to the total population of publicly owned engines. Below, we discuss the various types of government agencies with engines and the estimated costs for compliance with the proposed amendments.

Several State agencies provide services requiring stationary diesel equipment for public safety. Examples of these operations include prisons, government data storage facilities, emergency flood control, and college campuses. State agencies that may be impacted by the proposed amendments to the Guidelines Regulation include the Department of Corrections, General Services, the University of California and the California State University systems, the Department of Water Resources, the Franchise Tax Board, and the Department of Fish and Game. State owned and operated engines represent an estimated 9% of the total publicly owned engines. Based on this proportion, we estimate the costs for State agencies for compliance with the proposed amendments to be about $300,000.

Cities, counties, and other local government entities provide services requiring the use of diesel engines to ensure public safety or maintain essential services during emergencies. Examples include police departments, jails, fire departments, government data storage facilities, and sewage and water treatment facilities. In the event of power outages, floods, or other emergencies, this equipment prevents disruptions in critical operations. Local government owned and operated engines comprise an estimated 55% of the total publicly owned engines. Assuming that the costs are proportional to their contribution to the total population of public engines, we estimate the costs for these entities to be approximately $1.8 million.

Federal agencies operate stationary diesel engines in California and provide services for ensuring public safety and other essential government functions. Examples of operations include prisons, government data storage facilities, and military bases. We estimate the costs for federal agencies to be approximately $1.2 million.

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[1] Based on the survey information collected during the development of the stationary engine ATCM, of the engines operated by public agencies approximately 9% are owned by State agencies, 55% by federal agencies and 36% by local government agencies.

Most of the risk reduction compliance costs for the proposed amendments are not incurred for several years, which will allow government agencies sufficient time to request funding for any projected increase in costs associated with the operation of diesel engines subject to the proposed amendments. For many federal entities, including many military bases, stationary diesel engines are not likely to be located near receptors, and are less likely than private businesses to incur increased compliance costs associated with the proposed amendments.

Implementation Costs for ARB, OEHHA, and Districts

Districts review inventory plans and reports, review source test plans and reports, review health risk assessment calculations and assumptions, track facility status, emissions, and risk in a database, and make information available to ARB and the public. Districts also review public notification letters and attend public consultation meetings, review facility risk reduction audit and plans, and enforce facility risk reduction plans. ARB assists districts in implementing the "Hot Spots" Program, compiles emission inventories, develops and refines health risk assessment tools, and makes emissions and risk information available to the public. OEHHA adopts health values, develops and updates risk assessment guidelines, and assists districts in reviewing health risk assessments.

In is anticipated that ARB, OEHHA, and districts will cover any additional increase in implementation costs associated with the proposed amendments through the "Hot Spots" fees and existing program budgets and resources. The "Hot Spots" Program requires ongoing facility evaluations, and these activities are funded through current budget structures, which are reimbursed through facility fees.

G. State and District Fees

State fee rates for facilities subject to "Hot Spots" are listed in the AB 2588 Air Toxic "Hot Spots" Fee Regulation (Section 90700-90705, Title 17, California Code of Regulations) which lists the fee rates for each risk category. District staff compiles the prioritization scores and health risk assessment values for each facility and annually submits updated information to ARB staff. ARB staff uses the fee rate schedule to assign State fees to each facility subject to the "Hot Spots" Program. Each year a list of facility State fees is made available on ARB's web page at: http://www.arb.ca.gov/ab2588/2588fees.htm.

A facility is not subject to State fees if the facility:

(a) has a prioritization score of 10 or less; or
(b) has a health risk assessment for cancer of less than 1, and a health index of less than 0.1 for acute and chronic effects; or
(c) eliminates the release of toxics, which is enforceable by permit; or
(d) does not meet the criteria for inclusion in "Hot Spots".

For facilities that are subject to "Hot Spots" State fees, ARB intends to treat facilities with only diesel engines in a similar manner to the "industrywide" classification, which is used for gas stations and autobody shops. This enables ARB to apply the $35/yr "industrywide" fee for facilities with only diesel engines that are subject to State fees, rather than the regular fee rates, which range from $67 to $6,363. This is being done, in part, because of the efforts already underway to reduce emissions from diesel engines. However, facilities with sources of air toxics other than diesel engines may be assessed a higher State fee when the risk from diesel PM is added to their existing health risk assessment. These facilities would not qualify for the "industrywide" State fee rate.

Facilities already in the "Hot Spots" Program will pay the same State fee as in previous years until the facility has determined if the risk at the facility changes when diesel risk is included in the facility evaluation. For many facilities that are updating their emission inventory and health risk assessment, the State fee will not change. For the purposes of this cost analysis, if the State fee does not change for a facility, the State fee is not included in the analysis. Facilities with other toxics already subject to "Hot Spots" reporting and that are required to update their health risk assessment will remain in the same fee category until the health risk assessment has been approved by the district.

In order to provide for consistency and equity between districts, ARB will assess State fees for facilities with diesel engines not previously subject to "Hot Spots" no earlier than Fiscal Year (FY) 2008-2009. This provides more time for districts to evaluate the risk from facilities with diesel engines and provides facilities with an opportunity to expedite emission reductions to address "Hot Spots" requirements. This will also limit the uncertainty in State fees assessed for facilities already subject to State fees during the process of reevaluating their risk.

Because much of the "Hot Spots" requirements are being addressed through the stationary diesel engine ATCM, the State's costs for implementing the program will be minimized and the reduction in workload will be reflected in lower fees for facilities with only diesel engines. The current State fees are approximately $750,000 for FY 05-06. It is expected that State fees will increase in FY 2008-2009 by up to $380,255 due to the collection of fees from facilities subject to these amendments. The total State fees will then resume a steady decline as has been the case for the last several years. There is a legislative cap on State fees of $1,350,000 (H&SC Section 44380) and ARB staff does not expect the additional fees to exceed this cap. ARB staff will include in the "Hot Spots" Annual Status Report on State fees for applicable fiscal years a breakdown of fees so the public can understand what affect these amendments are having on diesel engine owners. All of ARB's previous annual status reports are located at: http://www.arb.ca.gov/ab2588/2588fees.htm.

A summary of the projected annual increases in State fees and costs due to the proposed amendments is summarized in Table III-8, and shows how State fees and costs are projected to drop as risk is reduced, and program requirements are met. The amounts in Table III-8 projections, and are based on assumptions about facility health

risks and "Hot Spots" Program requirements. State fees could be higher or lower than these amounts. Until facility evaluations are completed and the applicable State fees are assessed, these amounts are only an estimate. Additional information about each fee category and fee rates is provided in Appendix D of this staff report.

Table III-8: Summary of Projected State Fees and Cost Increases Due to the Proposed Amendments

	Estimated Number of Facilities with Diesel Engines	State Fees ($)			
		FY 2008-2009	FY 2009-2010	FY 2010-2011	FY 2011-2012
Previously exempted facilities	5,000	107,325	87,325	77,000	67,000
Facilities currently in "Hot Spots"	800	182,000	162,000	140,000	130,000
New facilities not previously in "Hot Spots"	7,652	90,930	70,930	60,000	50,000
TOTAL	**13,452**	**$380,255**	**$320,255**	**$277,000**	**$247,000**

Local district fee rules are approved by the local air district. The district determines how much to charge facilities, based on the workload associated with reviewing the facility's emissions and risk information. In some cases, districts will decide to treat diesel engine-only facilities like "industrywide" facilities, which reflects the fact that many of the "Hot Spots" Program requirements have been met by the facility complying with the stationary diesel engine ATCM. District fees are generally much lower for "industrywide" facilities, compared with larger, more complex facilities. Similar facilities in different districts may be charged different district fees, depending on each district's program needs and resources.

H. Economic Impacts

In this section, we analyze the potential impacts of the estimated costs of the proposed amendments on business enterprises in California. Section 11346.3 of the Government Code requires that, in proposing to adopt or amend any administration regulation, State agencies shall assess the potential for adverse economic impact on California business enterprises and individuals. The assessment shall include a consideration of the impact of the proposed or amended regulation 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 equipment costs, associated recurring costs, and fees. The analysis also uses publicly available

information to assess the impacts on competitiveness, jobs, and business expansion, elimination, or creation.

The types of businesses that may be impacted by the proposed amendments include facilities with diesel engines and facilities that emit a newly listed substance, or emit a substance with a new health value. Only the added costs triggered by the proposed amendments are included in this analysis. Any ongoing costs not attributed to the proposed amendments for facilities already subject to "Hot Spots" are not included. For State and district fees, only the increase in fees (attributed to the proposed amendments) above a facility's current fee level are included. A list of potentially affected businesses is provided in Appendix D, Table D-6, of this staff report.

The approach used in evaluating the potential economic impact of the compliance costs and State fees associated with these amendments on these businesses is outlined as follows:

(1) A typical business from selected affected industries was chosen based on the availability of financial data for the individual business.

(2) The highest reasonable compliance cost and State fees were estimated for each of those businesses. This includes the compliance costs for the preparation of an emission inventory or inventory update, new health risk assessment or update to an existing risk assessment, the State fee that is assessed on the facility (based on the outcome of the health risk assessment), public notification, preparation of a risk reduction audit and plan, and completing risk reduction. The compliance costs are extremely varied, with some businesses accruing no additional costs, while some businesses with a large number of diesel engines located close to nearby receptors may have to conduct public notification and risk reduction, and pay a high annual State and district fee until their risk is reduced.

(3) The "return on owner's equity" (ROE) was calculated for each of these businesses by dividing the net profit by the net worth. The adjusted compliance costs and applicable increased State fee were then subtracted from net profit data. The results were used to calculate an adjusted ROE. The adjusted ROE was then compared with the ROE before the subtraction of the adjusted compliance costs and State fee 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.

The threshold value of 10 percent has been used consistently by ARB staff to determine impact severity. This threshold is consistent with the thresholds used by the United States Environmental Protection Agency and others.

Since financial data were not available for all individual businesses subject to the proposed amendments to the Guidelines Regulation, this study used three-year

average (2002-2004) data from Duns Financial Profile for a nationwide typical business in each industry. Using the nationwide financial data, the ROE values before and after the subtraction of the adjusted compliance costs and fees were calculated for industries listed in Table D-6. The calculations were based on the following assumptions:

(1) All affected businesses are subject to federal and State tax rates of 35 percent and nine percent respectively.

(2) Affected businesses neither increase the prices of their products nor lower their costs of doing business through short run cost-cutting measures.

Given the limitation of available data, staff believes these assumptions are reasonable for most businesses; however, they will not be applicable to all businesses.

Potential Impact on Businesses

Typical California businesses are affected by the amendments to the extent that the implementation of the amendments would change their profitability. Using ROE to measure profitability, we found that the average ROE of sample businesses in the industries listed in Table D-6 changed by less than one percent. This represents a minor change in the average profitability of typical businesses in California. For a small number of businesses, the ROE changed by seven to eight percent. The impact on these businesses is likely to be small.

The change in profitability of individual industries with affected businesses, however, varied widely from the industry averages. For the industries listed in Table D-6, for example, the change in profitability ranged from a high of eight percent to a low of 0.001 percent. This variation in the impact of the amendments can be attributed mainly to two factors. First, some businesses are subject to higher compliance costs and State fees due to the type of industry in which they are involved, the type, quantity of emissions, potency of the substances that are emitted, the numbers of devices and emitting processes, and the location of the business. In most cases, the number of diesel engines and the location of the engines relative to nearby receptors (residences, schools, and other businesses) is the determining factor. For instance, the estimated compliance costs and State fees for sample businesses ranged from a high of $150,000 to a low of $0. Second, the performance of businesses may differ from year to year. Hence, the three-year average (2002-2004) nationwide financial data used may not be representative of a typical-year performance for some businesses.

The potential impacts estimated here may be high for the following reasons. First, the "Hot Spots" Program compliance costs and State fees are not new to most affected industries and businesses. Second, affected businesses probably would not absorb all of the increase in their costs of doing business. These facilities might be able to pass some of the cost on to consumers in the form of higher prices, reduce their costs, or do both.

Potential Impact on Consumers

No noticeable change in consumer prices is expected from the amendments because the compliance costs and State fees would have only a minor impact on the profitability of affected business.

Potential Impact on Employment

Since the compliance costs associated with the amendments impose no noticeable impact on the profitability of businesses, the staff expects no significant change in employment due to the imposition of the compliance costs and State fees. However, the amendments may impose hardship on some businesses operating with little or no margin of profitability, affecting the creation or elimination 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 amendments. This is because the amendments have no significant impact on the profitability of businesses in California. However, should the amendments impose significant hardship on California businesses operating with little or no margin of profitability, some small businesses may be forced out of the market or decide not to expand in California. Also, some businesses may decide against coming to California.

Impact on Small Businesses

Industries that are composed mostly of small businesses are not likely to own more than one diesel engine, and are therefore not likely to be subject to the proposed amendments to the Guidelines Regulation. In the case of a small business owning more than one engine, it would be unlikely for the facility to have a significant risk, and therefore the impact of the proposed amendments to the Guidelines Regulation would likely be small. However, if the small business did own several engines, the risk from those engines was significant, and the district's risk reduction threshold was relatively low, the impact on a small business could be significant. ARB staff assumed that a facility with multiple diesel engines was not likely to be a small business, and not likely to pose a significant risk. ARB staff is not aware of any business that exists in California that could fall into this category where the impacts are significant.

Impact on Business Competitiveness

The amendments would have little or no impact on the ability of California businesses to compete with businesses in other states. This is because the amendments do not impose a noticeable impact on the profitability of California businesses. However, the amendments may have an adverse impact on the ability of some California businesses, operating with little or no margin of profitability, to compete with businesses in other states.

I. Environmental Impacts

The staff is not aware of any significant adverse impacts on the environment resulting from the proposed amendments to the Guidelines Regulation. The proposed changes to the regulation are designed to better protect the public, including individuals that are the most sensitive, which include children, the elderly, and those with compromised immune systems.

IV. IMPLEMENTATION AND ADDITIONAL CONSIDERATIONS

The objectives of the "Hot Spots" Program are straightforward, they are: inventory emissions, evaluate the health risks, notify nearby receptors if there is a significant risk, and work to reduce the risk. However, the execution of the requirements can be somewhat complex, particularly to a facility that has not been subject to the program in the past. In this chapter, we provide a general discussion on how implementation of the proposed amendments will occur. We also discuss several aspects of the proposed amendments to the Guidelines Regulation that were raised at the public workshops and provide ARB staff's perspective.

A. Implementation Schedule

Because implementation of the stationary diesel engine ATCM is well-underway, facilities have already submitted engine inventory information to the districts. The ATCM required engine owners and operators to provide information about their engines (make, model, horsepower, location, nearby receptors etc.) by July 1, 2005. Under the Guidelines Regulation, the district may use the July 2005 diesel engine information to fulfill the emission inventory reporting requirements for the "Hot Spots" Program.

At the discretion of the district, facilities have the option to submit the 2006 or 2007 emissions inventory for use in calculating the facility prioritization score. The 2006 emissions data would allow districts to evaluate emissions after the stationary emergency standby (backup) diesel engines had reduced their operating hours to comply with the ATCM. The ATCM requires any operator choosing to reduce operating hours as a compliance option to be in compliance with the reduced hours by January 1, 2006. This could be a good option for facilities that did not track backup engine usage in the past, but are now subject to annual operating hour limits.

Using the 2007 emissions data may also allow some facilities that operate prime diesel engines, and that are in the process of retrofitting those engines, to estimate emissions after some of those controls are already in place. This may also serve as an incentive for a facility to retrofit or replace their engines more quickly to comply with "Hot Spots" and avoid the need for public notification.

Table IV-1 provides an example of the timeline for facilities subject to the "Hot Spots" Program. These timelines are consistent with the time allotted for completion of specified activities in H&SC Sections 44340, 44341, and 44343. This schedule is based on requirements in the statute, and may take up to four years to complete. The district determines the schedule for risk reduction.

Table IV-1: Timeline for a Facility Subject to "Hot Spots"

Facility Action
District notifies facility of "Hot Spots" requirements
Facility submits plan to district within 180 days
District approves plan within 120 days
Facility submits inventory report within 180 days
District approves report within 90 days
District prioritizes facility within 90 days
Facility submits HRA (if necessary) within 150 days
District sends HRA to OEHHA
OEHHA submits HRA comments within 180 days
District approves HRA within 1 year
Facility notifies public if risk from facility is high
Facility reduces significant risk to below risk threshold
Total Elapsed Time is 3 years and nine months.

Because compliance with the stationary diesel engine ATCM will fulfill all or most of the "Hot Spots" program requirements for the facilities, a modified implementation schedule will be available for facilities that meet the definition of a "diesel engine-only" facility. An example of an implementation schedule for these facilities is shown Table IV-2.

Table IV-2: "Hot Spots" Implementation Schedule for Diesel Engine-Only Facilities

Proposed Action for Diesel Engine-Only Facility	Date
District notifies facility of "Hot Spots" requirements	before January
Facility submits updated inventory to district upon request	by August
District calculates screening risk assessment score	December
Facility conducts health risk assessment if necessary	June
District approves health risk assessment	September
Facility conducts public notification if necessary	October
Facility reduces significant risk to below district risk reduction threshold	Within 3-10 yrs*

*The district determines timeframe for risk reduction.

B. Additional Considerations

Agricultural Engines

In the following paragraphs, we provide background information on how stationary diesel engines at agricultural operations will be addressed in the "Hot Spots" Program in light of other activities at the State and local level to reduce emissions from in-use stationary agricultural diesel engines. To minimize duplicative requirements, we intend to allow these programs to move ahead with cleaning up agricultural diesel engines and then use the "Hot Spots" Program to identify facilities that may pose a significant residual risk. We anticipate that most, if not all, of the risk reduction necessary will be addressed by the ATCM and equivalent district programs.

Currently, the stationary diesel engine ATCM affects only new agricultural engines, and establishes emissions performance standards for new agricultural engines similar to the requirements for new emergency standby engines. The existing ATCM does not include performance standards or operating hour restrictions for in-use agricultural engines. However, as mentioned, ARB staff is currently developing amendments to the ATCM to include requirements for in-use agricultural engines. One of the goals for the amendments to the ATCM is to include requirements for in-use agricultural engines that will help satisfy "Hot Spots" requirements in order to reduce compliance costs and minimize duplicative requirements. As currently proposed, the ATCM will:

- Establish performance standards that will require replacement or retrofit of existing engines to meet at least Tier 3 off-road engine certification standards
- Require registration for all agricultural engines and specify reporting of owner and operator information, location of engine, engine specifications (make, mode, bhp, age), operational information on hours of operation and fuel usage, as well as additional information about nearby receptors
- Allow owners/operators of existing Tier 0 engines, upon local air district approval, to wait until 2015 to install Tier 4 engines or electrify in cases where a Tier 3 engine would result in significant residual risk
- Allow alternative programs (for example, a district permitting program) or other district alternative, provided they are equivalent to the proposed registration program

The Board will consider amendments to the stationary diesel engine ATCM to include in-use stationary diesel agricultural engines at the same public hearing as the proposed amendments to the Guidelines Regulation will be considered. The proposed amendments to the ATCM are structured so that an inventory of agricultural engines in the State will be available, and the emissions from agricultural engines will be greatly reduced after compliance with the ATCM. Because the proposed amendments to the ATCM achieve such a significant reduction in risk for most engines, compliance with the ATCM will satisfy "Hot Spots" requirements in most, if not all, cases.

In order to minimize duplicative requirements and allow risk reduction to occur pursuant to the ATCM or an equivalent district program, ARB staff is proposing to postpone "Hot

Spots" applicability requirements for in-use agricultural diesel engines until after December 31, 2011. The adoption of the ATCM or equivalent district program indicates a decision to begin taking action to reduce risks immediately. This schedule allows engine operators five years to focus on cleaning up stationary diesel engines at agricultural operations through the ATCM process before triggering "Hot Spots" requirements. In addition, ARB, local air districts, and the agricultural industry have agreed to work together in the near-term to identify agricultural engines near schools residences, or other sensitive sites to ensure that the risk at facilities with these engines will be reduced below district thresholds as quickly and efficiently as possible. Although not all engines will be replaced by the end of 2011, the vast majority engines that could pose a significant risk will have been replaced, and facilities with new engines being installed will be below the district's risk reduction threshold. In 2012, facilities with stationary agricultural engines that still pose a residual risk above the district risk thresholds will be subject to "Hot Spots" program requirements. However, we anticipate that this will only affect a relatively small number of facilities with diesel engines located near populated areas.

The San Joaquin Valley Unified Air Pollution Control District has adopted its own rule covering stationary diesel engines at agricultural operations. The schedule for engine replacements contained in this rule will reduce the risk for most agricultural engines consistent with "Hot Spots" requirements. The rule has a compliance schedule which calls for the replacement of all non-certified compression ignition agricultural engines with EPA Tier 3 or Tier 4 certified engines by July 1, 2011. To allow both the implementation of the ATCM and the San Joaquin Valley rule, we propose that "Hot Spots" requirements for diesel engines at agricultural operations not be triggered until after 2011.

Unique Diesel Engine Applications

Engines exempt from permits, rules, regulations, registration programs, or the stationary diesel engine ATCM are not automatically exempt from "Hot Spots" if the facility operates any number of diesel engines subject to "Hot Spots" for more than 20 hrs/yr total at the facility, and the district has not evaluated the potential risk at the facility. For example, engines located on San Nicolas and San Clemente Island are likely low risk, but are not exempt from "Hot Spots"; engines that use digester or landfill gas, engines that have selective catalytic reduction, engines that operate on the outer continental shelf, and engines owned by the military and other agencies such as the National Aeronautical Space Administration must be included in the facility's emission inventory. Engines at hospitals and nuclear facilities may be exempt from hour limits as part of the ATCM, but their emissions may still be required to be included in their "Hot Spots" emission inventory reporting.

However, there are unique diesel engine applications where there is a compelling public safety or regulatory reason that justifies a district allowing an alternate risk reduction threshold for specified diesel engine applications. Based on a review of diesel engine applications, ARB recommends that districts adopt alternate risk reduction requirements for military tactical support equipment, direct-drive fire pumps that must meet National

Fire Protection Association (NFPA) specifications, and stationary emergency standby engines at nuclear power plants that are subject to the requirements of the United States Nuclear Regulatory Commission. The district may require risk reduction, where feasible and practical, for the other sources of toxics at the facility. In addition, these engines would still be subject to "Hot Spots" reporting and public notification requirements based on the entire risk at the facility. The three applications and the reasons why these engines should be given this consideration are provided below.

Military Tactical Support Equipment: Military tactical support equipment (TSE) is owned by the U.S. Department of Defense (U.S. DoD) and/or the U.S. Military services. TSE is used in combat, combat support, combat service support, tactical or relief operation, or training for such operations. TSE that must be configured and designed similarly to counterpart engines used by the U.S. DoD, U.S. Military services, or North Atlantic Treaty Organization forces are exempt from the stationary engine ATCM. This is because the U.S. DoD requires world-wide military standardization with respect to engine configuration and fuels. While the emissions from TSE can be included in an emission inventory if the use is routine and predictable and the district determines that the facility may pose a potential significant risk, ARB staff believes it is appropriate for the district to consider an alternative risk reduction requirement under "Hot Spots" to avoid conflict with U.S. DoD specifications and to not compromise U.S. defense operations.

Direct-drive Fire Pumps: Direct-drive fire pump engines are exempt from the ATCM if they are used solely to pressurize a fire suppression system and operated the number of hours necessary to comply with the inspection, maintenance, and testing requirements of the NFPA "Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems" (NFPA 25).

Fire pumps are used to supply water to fire sprinkler systems. These fire pumps are needed at sites where water pressure is insufficient for fire protection. Direct-drive fire pumps are fire pumps directly powered by a diesel-fueled engine. Generally, direct drive diesel engine fire pumps are used to power fire pumps in areas with unreliable electrical power and in remote areas. (ARB, September 2003) These engines are designed slightly different than other diesel-power sources to ensure reliability and running until engine failure. In addition, they are required by NFPA to be certified for fire pump service by a testing laboratory such as the Underwriters Laboratory (UL) or FM Global (FM) and are subject to requirements in State law that specify requirements for installation and maintenance and testing of the engine. Given the public safety concerns, ARB staff included an exemption in the ATCM for direct-drive fire pumps that must exceed the 30-hour annual cap required for emergency standby engines due to the NFPA 25 requirements. They were also exempt from the emissions performance standard since installing an emission control system by modifying the exhaust system may void the UL or FM lab certification. For the same reasons, ARB staff believes it is appropriate for districts to provide special consideration for these sources when determining risk reduction requirements under "Hot Spots" by establishing alternate risk reduction requirements.

Stationary Emergency Standby Engines at Nuclear Power Plants: Currently, there are two active nuclear power plants in California: the Diablo Canyon Nuclear Power Plant, Avila Beach, operated by the Pacific Gas and Electric Company, and the San Onofre Nuclear Generating Station, San Clemente, operated by the Southern California Edison Company. Both facilities have emergency standby stationary diesel engines that provide power for the emergency core cooling and other vital functions for the safe shutdown of the nuclear power plant. The ATCM exempts these engines from the operational requirements and emission standards if: it is an emergency standby engine used solely for the safe shutdown and maintenance of a nuclear facility; the engine is subject to the requirements of the Nuclear Regulatory Commission; and the engine operates 200 hours or less per year for maintenance and testing purposes. These engines were given an exemption from the ATCM because they provide for the safe-shutdown of a nuclear facility and as such are subject to unique requirements (hardened buildings, Nuclear Regulatory Commission required failure mode analysis) that make retrofitting or replacing the engines extremely costly. (ARB, September 2003) For these reasons, ARB staff also believes it is appropriate to provide them special consideration by districts during the determination of risk reduction requirements.

Health Risk Assessments

Under the proposed amendments, the 2003 OEHHA Health Risk Assessment Guidelines are replacing the 1992 CAPCOA Health Risk Assessment Guidelines. Because of this, some facilities may be required by the district to update their health risk assessment prepared following the CAPCOA risk assessment guidelines with a health risk assessment that follows the 2003 OEHHA Guidelines.

The OEHHA methodology utilizes a dose-based metric (mg/kg-d), rather than a concentration-based metric (ug/m^3); allows the use of the OEHHA-derived method; and allows for a tiered approach to risk assessment, referred to as a likelihood of risks, which includes a stochastic, or probabilistic, approach to health risk assessment. These changes have the potential of increasing the calculated risk for a facility by as much as 30% compared to the earlier CAPCOA risk assessment guidelines, due in part to changes in breathing rate as part of the dose-based assessment. ARB has provided Interim Risk Management Guidelines that recommend using, at a minimum, the 80% percentile breathing rate, as stated here: http://www.arb.ca.gov/toxics/harp/docs/rmpolicy.PDF. (ARB, October 2003) This means the results of past health risk assessments are roughly equivalent to a health risk assessment done today using the OEHHA Health Risk Assessment Guidelines, and the 80th percentile breathing rate. Districts will likely use their discretion as to which facilities may need to revise their previous health risk assessment. There is no explicit requirement for a facility with an old health risk assessment to update their health risk assessment using newer methodologies, unless the district determines that the past evaluation is not an accurate assessment of the facility as it currently operates.

For facilities with diesel engines that need to conduct a health risk assessment, the 2003 OEHHA Health Risk Assessment Guidelines provide guidance on calculating

health risk assessment for diesel PM in Appendix D. The following guidance for diesel PM is summarized from the OEHHA Health Risk Assessment Guidelines.

In August 1998, ARB identified diesel exhaust as a toxic air contaminant. OEHHA provided an inhalation non-cancer chronic reference exposure level (REL) and an inhalation cancer potency factor based on whole diesel exhaust (gas and particulate matter). The surrogate for whole diesel exhaust is diesel particulate matter (diesel PM). PM10 (particulate matter, ten microns or less in size) is often used as the basis for the potential risk calculations.

When conducting a health risk assessment, the potential cancer risk from inhalation exposure to diesel PM is always required to be calculated. The non-cancer chronic inhalation health impacts of diesel PM are also to be calculated, using the available chronic REL for whole diesel PM. As stated in the OEHHA Guidance Manual, the potential inhalation cancer risk will usually outweigh the potential non-cancer health impacts. There may be certain situations where an evaluation of the acute non-cancer health effects may be warranted (such as a nearby receptor on a hillside or other location above the emission release point). Because there is no acute REL for whole diesel exhaust, the components of the exhaust would need to be speciated to conduct an acute analysis, addressing any substances in the speciation profile for which an acute REL is available (e.g., acrolein).

Other than for possible acute analysis, speciation of the diesel exhaust components is not generally required. When comparing whole diesel exhaust to the chemically speciated diesel exhaust components (e.g., metals, PAHs), the potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multipathway cancer risk from the speciated components. For this reason, there will be few situations where an analysis of multipathway risk is necessary. However, districts may elect to require a multipathway analysis if reliable data are available and the district decides that it is necessary.

Alternative Diesel Fuels and Health Risk Assessments

During the public workshops to discuss the proposed amendments to the Guidelines Regulation, questions were raised regarding what fuels can be used in a stationary diesel engine, and how the risk from diesel engines operating on alternative fuels or alternative diesel fuels should be evaluated.

With respect to the types of fuels allowed to be used in stationary diesel engine, the current version of the ATCM requires that all new and in-use stationary compression-ignition engines in California use only specified fuels. The allowable fuels include the following:

- CARB Diesel Fuel;

- An "alternative diesel fuel" that meets the requirements of ARB's Verification Procedure, as codified in Title 13, California Code of Regulations, Sections 2700-2710;

- An "alternative fuel" (e.g., compressed natural gas (CNG), liquefied petroleum gas (LPG), biodiesel);

- CARB Diesel Fuel used with fuel additives that meet the requirements of the Verification Procedure; or

- Any combination of the above.

No other fuels should be in use in stationary diesel engines in California.

There are some differences in how the individual substances emitted from these various types of fuels should be reported under the "Hot Spots" emission inventory reporting requirements. The proposed reporting for substances is discussed below.

- If the fuel is CARB diesel fuel or contains more than 1% of CARB diesel fuel (including cases where the engine is dual-fired), the emissions from the engine must be reported as diesel PM emissions. The pollutant identification number 9901 for *Diesel engine exhaust, particulate matter* on the "Hot Spots" Appendix A-I list of substances would be used for diesel emissions.

- If the fuel is an "alternative diesel fuel" as defined in the ATCM (such as Fischer-Tropsch fuels or emulsions of water in diesel fuel), and it contains diesel fuel in the blend, the emissions from the engine must be reported as diesel PM emissions (using emittent ID 9901).

- For pure biodiesel blends (99%+), the emissions would be reported as the speciated components from the particle-phase and the gas/vapor phase, rather than as diesel PM.

- If the fuel is an "alternative fuel" as defined in the ATCM (such as compressed natural gas (CNG) or liquefied petroleum gas (LPG), and does not contain any diesel fuel, the emissions from the engine would be reported as the speciated components from the particle-phase and the gas/vapor phase, rather than as diesel PM.

For purposes of health risk evaluation under the "Hot Spots" requirements, any engine for which diesel PM has been reported (i.e., it uses the emittent ID 9901), the OEHHA inhalation cancer risk factor for diesel exhaust PM would be applied, and the previous methods would be used. For engines for which only the speciated components are required to be reported (e.g., a CNG engine), the risk evaluation would be based on the speciated components, including any cancer and non-cancer health effects values associated with the speciated substances.

Routine and Predictable Operations for Diesel Engines

The "Hot Spots" Program requires emission reporting based on routine and predictable emissions from a facility. This includes activities that occur at the facility on a regular basis. It is not limited to regular activities that occur on a daily or monthly basis but can also include activities that might occur once every few years if the activity is planned in advance and occurs on a repeating basis. Because there are such a wide variety of circumstances and conditions between different industries and different air pollution control districts, the determination of what constitutes a routine or predictable activity has been left to the discretion of the districts. ARB proposes to continue that practice. Based on comments ARB staff received at the public workshops, there is some uncertainty among affected facilities about what can be interpreted to be a routine and predictable activity.

In this section, ARB staff provides some examples of what diesel engine applications and operations may be routine and predictable and subject to "Hot Spots" reporting. However, in the final analysis, it will be up to each district to determine how to address routine and predictable operations.

The definition of routine and predictable in the proposed amendments to the Guidelines Regulation is as follows: "Routine and Predictable" is determined by the district, and means all of the regular operations at the facility. Emergency or catastrophic releases at a facility are not routine and predictable and are not included in a facility's emission inventory.

Several examples of diesel engine activities that the district could determine to be routine and predictable, and required to be reported under "Hot Spots" are as follows:

- Regular maintenance and testing of a diesel engine
- Routine use of rented or leased portable engines, even if the identity of the engines are not known (the district could require the facility operator to estimate the total number of hours that the engines operated, and a reasonable estimate of the emissions resulting from those operations)
- Any maintenance activity that could reasonably be predicted to occur at least every few years using either a stationary or portable engine
- Most "hot standby" or other operations in preparation for a potential electrical outage (unless a power outage is imminent – see last example below)

Several examples of diesel engine activities that the district probably would <u>not</u> determine to be routine and predictable are as follows:

- Construction activities or capital improvements lasting a few months

- A limited number of hours of start-up testing after installation of a new engine, or after the initial failure of an in-use engine
- Activities directly related to a short-term response to a natural disaster or unforeseen severe weather, or unforeseen accidental spill or release
- One-time activities that are not considered part of regular maintenance at a facility
- The temporary use of a portable engine to respond to an unforeseen equipment breakdown or malfunction
- Short periods of engine use immediately preceding an imminent electrical outage

Most of the issues related to determining what constitutes routine and predictable activities involve portable diesel engines. As described in previous sections of this report, portable engines (and engines equal to or less than 50 hp) are not included in a facility's emission inventory unless the district determines there is good cause to expect the engines at the facility may pose a significant risk. This could include emissions that are routine and predictable, but because of the amount and location of the emissions, the risk is not expected to be significant. This provision enables the district to focus their facility evaluation only on activities that are likely to pose a significant risk. This reduces the regulatory burden on facilities that must report their diesel engine emissions, while still protecting public health.

Public Notification

The district determines how public notification is conducted by facilities with significant risk, as described in H&SC Section 44362 which states that "[A]ny notice shall be made in accordance with procedures specified by the district." Several districts are considering handling initial public notification for facilities with diesel engines that pose a significant risk using the internet. ARB is recommending that districts consider grouping similar facilities together for purposes of initial public notification.

Listed Substances With No Approved Source Test Method

For some listed substances, an approved source test method to estimate emissions does not exist. ARB staff is currently working with districts and industry to determine if new source test methods are available for several substances that are subject to the AB 2588 "Hot Spots" Program. The two substances that have the greatest potential to trigger additional "Hot Spots" requirements are acrolein and crystalline silica. For most cases, ARB recommends that districts postpone requiring reporting emissions of those substances until adequate source test methods and emission factors are available.

In the past, facilities have participated in test method development, and conducted pooled source tests, in order to better estimate emissions of listed substances. For acrolein and respirable crystalline silica, future collaboration between ARB, districts, and facilities may be necessary in order to estimate emissions for these substances.

The following information describes ongoing efforts being made in this regard.

Acrolein

Acrolein is emitted from combustion processes in varying amounts. The source test method that is the basis for the emission factors used in the "Hot Spots" Program is ARB Test Method 430, which has been shown to underestimate acrolein emissions. ARB Test Method 430 is based on a 2,4-dinitrophenylhydrazine (DNPH) impinger method for formaldehyde, but causes degradation of the sample during the collection of acrolein. ARB staff has conducted testing to better understand other methods that could replace ARB Test Method 430, but more work must be done.

Respirable Crystalline Silica

Crystalline silica has been required to be reported under the "Hot Spots" Program since 1989. However, only respirable particle sizes are now subject to reporting requirements. Facilities that have submitted total crystalline silica (or crystalline silica less than PM10) may need to reevaluate their emissions and resubmit crystalline silica emissions that reflect particles with mean mass aerodynamic diameter four microns and smaller. Industry has begun testing using PM2.5 ambient samplers that have been modified to collect PM4, but more work must be done to verify that all of the PM4 is being collected. Facilities that have reported crystalline silica in the past are primarily aggregate (sand and gravel) facilities, and are more likely to be impacted by the proposed amendments.

Acronyms

AB	Assembly Bill (AB 2588)
ARB, or the Board	Air Resources Board
ATCM	Airborne Toxic Control Measure (for stationary diesel engines)
Cal/EPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAS	Chemical Abstracts Service
CCR	California Code of Regulations
CEIDARS	California Emission Inventory Development and Reporting System (CEIDARSII – CEIDARS 2.5)
CTI	California Toxics Inventory
Diesel PM	Diesel Particulate Matter
EIC&GR	AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Report/Regulation
g/bhp-hr	Grams per brakehorsepower-hour
Guidelines Regulation	AB 2588 Air Toxics "Hot Spots" Emission Inventory Criteria and Guidelines Report/Regulation
HAP	Hazardous Air Pollutant
HARP	HotSpots Analysis and Reporting Program
H&SC	California Health and Safety Code
ISCST3	Industrial Source Complex Short Term version 3, a U.S. EPA air dispersion model
LOD	Limit of Detection
NFPA	National Fire Protection Association
OEHHA	Office of Environmental Health Hazard Assessment
PCB	Polychlorinated biphenyl
PM	Particulate Matter
PM_{10}	Particulate Matter range 10 microns or less in diameter
REL	Reference Exposure Level
ROE	Return on Equity
SIC	Standard Industrial Classification code
TAC	Toxic Air Contaminant
TSE	Tactical Support Equipment
US or S-UP	Update Summary or Summary Update
U.S. DoD	United States Department of Defense
U. S. EPA	United States Environmental Protection Agency

References for Staff Report

1. (ARB, 1998) California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant: Health Risk Assessment for Diesel Exhaust; Appendix III, Part B.

2. (ARB, October 2000) Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.

3. (ARB, September 2003) Staff Report: Initial Statement of Reasons for Proposed Rulemaking: Airborne Toxic Control Measure For Stationary Compression-Ignition Engines.

4. (OEHHA, March 1999) AB 2588 Air Toxics "Hot Spots" OEHHA Health Risk Assessment Guidelines - *Part I. The Determination of Acute Reference Exposure Levels for Airborne Toxicants.*

5. (OEHHA, December 2002) AB 2588 Air Toxics "Hot Spots" OEHHA Health Risk Assessment Guidelines - *Part II. Technical Support Document for Describing Available Cancer Potency Factors.*

6. (OEHHA, April 2000) AB 2588 Air Toxics "Hot Spots" OEHHA Health Risk Assessment Guidelines - *Part III. Technical Support Document for the Determination of Chronic Reference Exposure Levels.*

7. (OEHHA, September 2000) AB 2588 Air Toxics "Hot Spots" OEHHA Health Risk Assessment Guidelines - *Part IV. Technical Support Document for Exposure Assessment and Stochastic Analysis.*

8. (OEHHA, August 2003) AB 2588 Air Toxics "Hot Spots" OEHHA Health Risk Assessment Guidelines - *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.*

9. (ARB, October 2003) Recommended Interim Risk Management Policy For Inhalation-Based Residential Cancer Risk.

10. (ARB, April 2005) Consolidated Table of OEHHA / ARB Approved Risk Assessment Health Values.

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE AREA DESIGNATIONS FOR STATE AMBIENT AIR QUALITY STANDARDS

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 regulations designating areas of California as attainment, nonattainment, nonattainment-transitional, or unclassified for pollutants with State ambient air quality standards set forth in section 70200 of title 17, California Code of Regulations.

DATE: November 16, 2006

TIME: 9:00 a.m.

PLACE: California Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

This item will be considered at a two-day meeting of the Board, which will commence at 9:00 a.m., November 16, 2006, and may continue at 8:30 a.m., November 17, 2006. This item may not be considered until November 17, 2006. Please consult the agenda for the meeting, which will be available at least 10 days before November 16, 2006, to determine the day on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette, or computer disk. Please contact ARB's Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at 916-323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to title 17, California Code of Regulations (CCR), sections 60201, 60202, 60205, and 60210.

Background: The Board is charged with the responsibility of adopting standards of ambient air quality for each air basin in consideration of the public health, safety, and welfare (Health and Safety Code (H&SC) section 39606). To date, the Board has adopted State ambient air quality standards (State Standards) for ten pollutants, set forth in CCR, title 17, section 70200. In addition, H&SC section 39607(e) requires the Board to establish designation criteria which provide the basis for designating areas of California as attainment or nonattainment with respect to the State standards. The

Board originally adopted designation criteria in 1989 and has modified them several times, most recently in January 2004. The designation criteria are set forth in CCR, title 17, sections 70300 through 70306, and appendices 1 through 4 thereof. Based on these designation criteria, H&SC section 39608 further requires ARB to establish and annually review area designations for State standards. During the annual review, ARB determines whether changes to the existing area designations are warranted, based on an evaluation of recent air quality data.

The ARB makes area designations for ten pollutants: ozone, suspended particulate matter (PM10), fine suspended particulate matter (PM2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles. The area designations comprise CCR, title 17, sections 60200 through 60210. This year's review of the area designations is based on air quality data from 2003 through 2005. The proposed amendments include changes to existing area designations for ozone, carbon monoxide, PM10, and PM2.5. This is the first year the new State 8-hour ozone standard is being considered in the area designation process. It became effective May 17, 2006. The changes to the ozone designations listed below are primarily due to the addition of this new more health-protective standard. All the recommended changes are summarized below:

Ozone:

- Designate the Sonoma County portion of the North Coast Air Basin, Siskiyou County in the Northeast Plateau Air Basin, and San Luis Obispo County in the South Central Coast Air Basin as nonattainment. These areas are currently designated as attainment.
- Designate Inyo County in the Great Basin Valleys Air Basin as nonattainment. This area is currently designated as unclassified.
- Designate the Lake Tahoe Air Basin, as well as Lassen and Modoc Counties in the Northeast Plateau Air Basin, as unclassified. These areas are currently designated as attainment.

In addition, there are a number of changes for ozone that occur by operation of law. Under H&SC section 40925.5, reclassifications between nonattainment and non-attainment transitional status for ozone occur by operation of law. While these changes do not require formal action by the Board, ARB's designation criteria contain guidelines for confirming such changes. Therefore staff is proposing that the Board confirm the changes and modify the designation regulations to reflect these automatic changes. In all cases, the areas are reverting back to nonattainment from nonattainment-transitional. These changes are summarized for completeness below.

- Change the designation of the North Central Coast Air Basin as nonattainment. This air basin is currently designated as nonattainment-transitional.

- Change the designation of the following Sacramento Valley Air Basin (SVAB) counties to nonattainment. They are currently designated as nonattainment-transitional.

  - Butte County
  - Shasta County
  - Solano County (portion in SVAB)
  - Sutter County
  - Tehama County
  - Yolo County
  - Yuba County

Carbon Monoxide:

- Designate Imperial County in the Salton Sea Air Basin as attainment. The City of Calexico is currently designated as nonattainment, while the remainder of Imperial County is designated as unclassified. Calexico was the last remaining nonattainment area for the State carbon monoxide (CO) standards. With this change, all areas of California will be attainment or unclassified for CO.

PM10:

- Designate the Sonoma County portion of the North Coast Air Basin as attainment. This area is currently designated as nonattainment.

PM2.5:

- Designate San Luis Obispo County in the South Central Coast Air Basin as attainment. This area is currently designated as unclassified.

COMPARABLE FEDERAL REGULATIONS

There are no comparable federal or local regulations that address area designations for the California State standards.

AVAILABILITY OF DOCUMENTS AND CONTACT PERSONS

The Board staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The Staff Report is entitled: "Initial Statement of Reasons for Proposed Rulemaking: 2006 Area Designations and Maps."

Copies of the ISOR and the full text of the proposed regulatory language, in underline and strike-out format to allow for comparison with the existing regulations, may be accessed on ARB's website 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, California 95814, (916) 322-2990 at least 45 days prior to the scheduled hearing on November 16, 2006.

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 ARB's website listed below.

Inquires concerning the substance of the proposed regulations may be directed to the designated agency contact persons: Theresa Najita, Air Pollution Specialist, Particulate Matter Analysis Section, at (916) 322-7297 or via email at tnajita@arb.ca.gov, or Sylvia Morrow, Manager, Particulate Matter Analysis Section, (916) 324-7163 or via email at smorrow@arb.ca.gov.

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 Alexa Malik, Regulations Coordinator, (916) 322-4011. 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 ARB Internet site for this rulemaking at http://www.arb.ca.gov/regact/area06/area06.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 and private persons and businesses in reasonable compliance with the proposed regulations are presented below.

The proposed amendments to the area designation regulations do not contain any requirements for action. Subsequent requirements for action may result after additional steps, such as plan preparation and approval, are taken. The area designations are simply labels that describe the healthfulness of the air quality in each area. Because these regulations by themselves contain no requirements for action, they have no direct economic impact, and the following general determinations are appropriate.

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 cost or savings to state or local agencies.

In developing this regulatory proposal, 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 also 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 not affect small businesses because the proposed regulatory action does not contain any requirements for action.

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board 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 email 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 15, 2006**, and addressed to the following:

Postal mail: Clerk of the Board, Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

Facsimile submittal: (916) 322-3928

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 H&SC sections 39600, 39601, 39606, 39608, and 40925.5. This action is proposed to implement, interpret, and make specific sections 39606, 39607, 39608, and 40925.5 of the H&SC.

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 ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990.

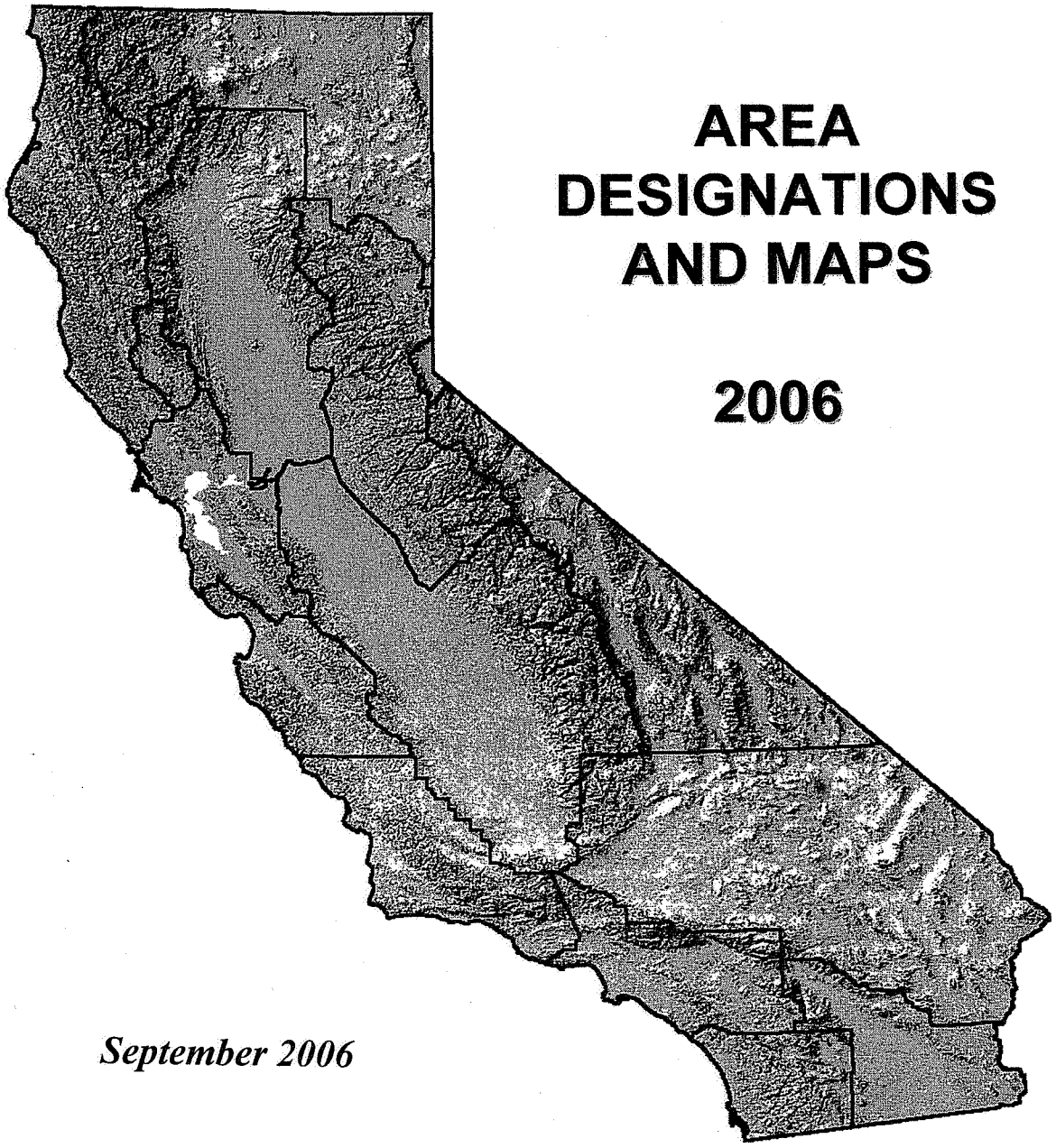
CALIFORNIA AIR RESOURCES BOARD

Catherine Witherspoon
Executive Officer

Date: September 19, 2006

California Environmental Protection Agency

Air Resources Board



AREA DESIGNATIONS AND MAPS

2006

September 2006

2006

Area Designations and Maps

STAFF REPORT:
Initial Statement of Reasons for Proposed Rulemaking

Release Date: September 29, 2006

California Environmental Protection Agency
Air Resources Board
Planning and Technical Support Division
P. O. Box 2815
Sacramento, California 95812

This document has been reviewed and approved by the staff of the California Environmental Protection Agency, Air Resources Board. Approval does not signify that the contents necessarily reflect the views and policies of the California Air Resources Board.

If you have special language needs, please contact Theresa Najita, document coordinator, at (916) 322-7297 or *tnajita@arb.ca.gov.*
TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

ACKNOWLEDGMENTS

This document was prepared by the staff of the
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EXECUTIVE SUMMARY

The Air Resources Board (ARB or Board) has established health-based State ambient air quality standards (State standards) to identify outdoor pollutant levels considered safe for the public—including those individuals most sensitive to the effects of air pollution, such as children and the elderly. After State standards are established, State law requires ARB to designate each area as attainment, nonattainment, nonattainment-transitional, or unclassified for each State standard. The area designations, which are based on the most recent available data, indicate the healthfulness of the air quality throughout the State.

As required by State law, ARB established designation criteria to ensure that the area designations for State standards are made in a consistent manner (refer to Attachment A for the full text of the designation criteria). Based on these criteria and as required by State law, the Board originally adopted the area designation regulations in 1989. Under State law, the Board must review the area designations each year and make changes as necessary based on the most recent data. Currently, the Board makes area designations for the ten pollutants with State standards listed in title 17, California Code of Regulations, section 70200: ozone, suspended particulate matter (PM10), fine suspended particulate matter (PM2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, sulfates, hydrogen sulfide, and visibility reducing particles.

Proposed Changes to the Area Designation Regulations

Based on the 2003 through 2005 air quality data, ARB staff is proposing changes to the current area designation regulations for carbon monoxide, PM10, and PM2.5 for several areas of California. In addition, ARB staff is proposing a number of changes for ozone, based primarily on the new 8-hour State ozone standard which the Board adopted in April 2005 and which became effective in May 2006. The proposed changes are summarized in Table ES-1.

Under State law, the area designation changes for carbon monoxide, PM10, PM2.5, and seven of the changes for ozone require formal action by the Board. In contrast, the eight ozone designation changes from nonattainment-transitional to nonattainment occur by operation of law under the provisions of Health and Safety Code (H&SC) section 40925.5. However, ARB staff is proposing the Board confirm these changes in the area designation regulations. The full text of these proposed regulatory changes can be found in Attachment B.

Based on the 8-hour State ozone standard, a number of areas will be changing to a nonattainment designation. As a result, these areas will need to develop attainment plans, pursuant to State law requirements (H&SC section 40911). Air Pollution Control and Air Quality Management Districts (districts) with areas changing from nonattainment-transitional to nonattainment should already have a plan in place, but may need to revise the plan to ensure expeditious attainment of both the State 1-hour and 8-hour standards. In contrast, districts with areas changing from attainment or unclassified to nonattainment may not have a plan currently in place, or may be

entering the planning process for the first time. In these cases, ARB staff will work with the districts to develop their plans and ensure they are consistent with the requirements of State law. Additional information on the implications of the area designations with respect to the planning process for State ambient air quality standards can be found in Chapter I.D.

Other Information in this Staff Report

As required by State law, this staff report also includes maps and tables identifying areas with at least one violation of a State standard or national ambient air quality standard (national standard). The maps and tables provided in Attachment C fulfill the statutory requirement in H&SC section 40718 and reflect the proposed area designations for State standards that are summarized in this staff report. The maps and tables also reflect the current area designations for national standards.

TABLE ES-1

PROPOSED AREA DESIGNATIONS FOR STATE STANDARDS

2006 PROPOSED AREA DESIGNATION CHANGES			
Pollutant	*Air Basin/ County*	*Current Designation*	*Proposed 2006 Designation*
Ozone	Great Basin Valleys Air Basin / Inyo County	U	**N**
	Lake Tahoe Air Basin	A	**U**
	North Central Coast Air Basin	NA-T**	**N**
	North Coast Air Basin (NCAB) / Sonoma County (NCAB portion)	A	**N**
	Northeast Plateau Air Basin		
	Lassen County	A	**U**
	Modoc County	A	**U**
	Siskiyou County	A	**N**
	Sacramento Valley Air Basin (SVAB)		
	Butte County	NA-T**	**N**
	Shasta County	NA-T**	**N**
	Solano County (SVAB portion)	NA-T**	**N**
	Sutter County	NA-T**	**N**
	Tehama County	NA-T**	**N**
	Yolo County	NA-T**	**N**
	Yuba County	NA-T**	**N**
	South Central Coast Air Basin / San Luis Obispo County	A	**N**
CO	Salton Sea Air Basin / Imperial County	N / U	**A**
PM10	North Coast Air Basin (NCAB) / Sonoma County (NCAB portion)	N	**A**
PM2.5	South Central Coast Air Basin / San Luis Obispo County	U	**A**

Designation Categories:
A = Attainment; N = Nonattainment; NA-T = Nonattainment-Transitional; U = Unclassified.

** The change in ozone designation from nonattainment to nonattainment-transitional occurs by operation of law under Health and Safety Code section 40925.5. Similarly, the change from nonattainment-transitional back to nonattainment also occurs by operation of law.

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CHAPTER I

BACKGROUND

A. INTRODUCTION

This chapter provides background information on the differences between the State and national ambient air quality standards, the legal requirements for the State designation criteria and area designations, the implications of being designated for the various pollutants, and the public process used in developing the proposed amendments to the area designation regulations. The proposed changes to the area designations are described in Chapter III.

B. STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

To protect public health, the Air Resources Board (ARB or Board) has adopted health-based ambient (outdoor) air quality standards. These standards define the maximum amount of an air pollutant that can be present in ambient air without harm to the public's health. Ambient air quality standards are established to protect even sensitive individuals in our communities. California law requires ARB to set State ambient air quality standards (State standards) in consideration of public health, safety, and welfare. The Board has adopted State standards for ten pollutants: ozone, suspended particulate matter (PM10), fine suspended particulate matter (PM2.5), carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles.

In addition to the State standards, the Federal Clean Air Act requires the United States Environmental Protection Agency (U.S. EPA) to set national ambient air quality standards (national standards) for the nation. It also permits states to adopt additional or more health-protective standards. California's State standards for most pollutants are more protective of public health than national standards. In addition, California has established State standards for other pollutants that are not covered by national standards (for example, sulfates, hydrogen sulfide, and visibility reducing particles).

An ambient air quality standard is generally specified as a concentration averaged over a specific time period, such as one hour, eight hours, 24 hours, or one year. The different averaging times and concentrations are meant to protect against different exposure effects. Some ambient air quality standards are expressed as a concentration that is not to be exceeded. Others are expressed as a concentration that is not to be equaled or exceeded.

The national standards are further categorized as primary standards and secondary standards. The national primary standards are meant to protect public health. The national secondary standards are meant to protect the public welfare from any known

or anticipated adverse effects of the pollutant. The national standard area designation maps and tables in Attachment C reflect the national primary standards. Attachment C also contains a table that lists the applicable pollutant levels, averaging times, and analytical measurement methods for both the State standards and the national standards.

The U.S. EPA promulgated new national ozone and PM2.5 standards in July 1997. In April 2004, the U.S. EPA made area designations for the new national 8-hour ozone standard. Therefore, maps and tables for the 8-hour standard are included in Attachment C. The national 1-hour ozone standard was revoked effective June 15, 2005. Maps and tables for the national 1-hour standard are, therefore, not included in this report.

U.S. EPA has also issued area designations for the national PM2.5 standards which became effective in April 2005. A map and table depicting these designations are included in Attachment C. Two areas of California are nonattainment for the national PM2.5 standard: the South Coast Air Basin and the San Joaquin Valley Air Basin.

C. LEGAL REQUIREMENTS

Health and Safety Code (H&SC) section 39607(e) requires the Board to establish criteria for designating areas as attainment or nonattainment for the State standards and to periodically review these criteria to ensure their continued relevance. The criteria describe the procedures that the Board must use in determining area designations for State standards and are summarized in Chapter II. The Board originally adopted the required designation criteria in June 1989 and subsequently amended them in June 1990, May 1992, December 1992, November 1993, November 1995, September 1998, and most recently, in January 2004.

H&SC section 39608 requires the Board to use the designation criteria in designating areas of California as attainment, nonattainment, or unclassified for the State standards. In addition, HS&C section 40925.5 provides a mechanism for redesignating a nonattainment district as nonattainment-transitional for ozone. Finally, H&SC section 39608 requires the Board to conduct an annual review of the area designations and update them as new information becomes available. As warranted, the Board makes changes to the existing area designations, as well as making area designations for any new or revised State standards.

The area designations are made on a pollutant-by-pollutant basis, for all pollutants listed in the California Code of Regulations, title 17, section 70200. These pollutants are: ozone, suspended particulate matter (PM10), fine suspended particulate matter (PM2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles. In April 2005, the Board reaffirmed the existing 1-hour State ozone standard and adopted a new State 8-hour ozone standard. The 8-hour standard of 0.070 parts per million (ppm) became effective on May 17, 2006.

This year's review of the State area designations is the first to consider the State 8-hour ozone standard. Furthermore, because the 8-hour standard is more health-protective than the 1-hour standard, we are recommending a change in area designation for a number of areas, as described in Chapter III.

In addition to the designation criteria and area designation requirements, H&SC section 40718 requires the Board to publish maps showing the areas with one or more measured violations of any State standard or national standard. The maps and summary tables provided in Attachment C fulfill this requirement. The maps and tables for the State standards reflect the changes to the area designations as described in Chapter III. The maps and tables for the national standards reflect the current federal area designations, as promulgated by the U.S. EPA. For additional information about the area designations for national standards, visit the U.S. EPA website at:

http://www.epa.gov/airprogm/oar/oaqps/greenbk

D. IMPLICATIONS OF THE STATE AREA DESIGNATIONS

The State designation criteria specify four designation categories: nonattainment, nonattainment-transitional, attainment, and unclassified. A nonattainment designation indicates one or more violations of the State standard have occurred. A nonattainment-transitional designation is a subcategory of nonattainment that indicates improving air quality, with only occasional violations or exceedances of the State standard. In contrast, an attainment designation indicates no violation of the State standard. Finally, an unclassified designation indicates either no or an incomplete set of air quality data. Although the area designations themselves are simply labels indicating the healthfulness of air quality and do not contain any requirements for action, there may be other legal requirements, based on an area's designation status, as described below.

1. Areas Designated as Nonattainment

An air pollution control district or air quality management district (district) that includes an area designated as nonattainment for a particular pollutant, experiences several consequences under the law. First, State law requires nonattainment districts to develop plans for attaining the State standards for ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide. The nonattainment districts must submit these attainment plans to the Board for approval (H&SC section 40911). Ozone nonattainment districts that are impacted by transport from upwind areas (in other words, ozone violations are caused by emissions transported from upwind areas located outside the district) are required to develop ozone attainment plans to mitigate those violations that occur in the absence of transport (in other words, ozone violations that are caused by locally generated emissions; H&SC sections 39610(b) and 40912). Violations caused by a combination of transported and locally generated emissions must be mitigated by both the upwind and downwind areas. Ozone violations caused by overwhelming transport

must be mitigated by the responsible upwind district(s).

In addition to these requirements for nonattainment districts, on October 8, 2003, Senate Bill 656 (Sher) was signed by the Governor. This law requires ARB to develop and adopt (by January 1, 2005) a list of the most readily available, feasible, and cost-effective control measures to reduce PM10, PM2.5, and their precursor emissions to make progress toward attaining the State and national PM2.5 and PM10 standards. The list of measures was developed in consultation with the districts, and approved by ARB in November 2004. These control measures were based on rules, regulations, and programs in effect in California as of January 1, 2004. The districts were required to adopt implementation schedules for the most cost-effective subset of measures appropriate to the nature and severity of the PM problem in each area by July 31, 2005.

Finally, a district with an area designated as nonattainment for any of the remaining pollutants is not subject to any specific statutory planning requirements. However, such districts must adopt and enforce rules and regulations to expeditiously attain the State standards for these pollutants (H&SC sections 40001 and 40913). Furthermore, a nonattainment district has the option of developing and implementing an attainment plan or adopting regulations to control the emissions that contribute to these pollutants (H&SC section 40926).

The second consequence of a nonattainment designation is that the Board collects fees from large, nonvehicular sources located in the nonattainment area (H&SC section 39612; CCR, title 17, sections 90800.8 through 90806). District sources permitted to emit 250 tons per year or more of any nonattainment pollutant or its precursors are subject to these fees. The fees are used to help defray the costs of State programs related to nonvehicular sources.

With certain exceptions, nonattainment districts are authorized to levy a fee of up to $6.00 on motor vehicles registered in the district for the implementation of the California Clean Air Act and incentive programs to reduce emissions (H&SC sections 44223 and 44225).

2. Areas Designated as Nonattainment-Transitional

Nonattainment-transitional is a subcategory of the nonattainment designation. Therefore, a district with a nonattainment area that is redesignated as nonattainment-transitional is still subject to the same requirements as described in the preceding section. However, in contrast to the nonattainment designation, a nonattainment-transitional designation may signal a change in how these requirements are implemented. For example, a district that currently is implementing an approved attainment plan may determine that some of the additional control measures contained in the attainment plan are not needed to reach attainment by the earliest practicable date. As a result, the nonattainment-transitional designation provides the district with a signal that it may be appropriate to review, and perhaps modify, its approved attainment

plan. However, district actions in response to a nonattainment-transitional designation must be consistent with State and federal regulations and statutes.

H&SC section 40925.5 specifically allows a district with an area designated as nonattainment-transitional for ozone to shift some stationary source control measures from the rulemaking calendar to the contingency category if the district finds these control measures are no longer necessary to accomplish expeditious attainment of the State ozone standard. These actions do not apply to control measures required to mitigate the effects of pollutant transport. The Board may disapprove any action of the district within 90 days if the Board finds that the action will delay expeditious attainment of the State ozone standard.

3. Areas Designated as Attainment or Unclassified

State law does not impose any specific planning requirements upon districts with areas designated as attainment or unclassified. However, State law does require that the State standards not only be attained but also, maintained. State law requires the districts and the Board to make a coordinated effort to protect and enhance the ambient air quality (H&SC sections 39001 through 39003). As part of this effort, the districts must adopt rules and regulations sufficiently effective to achieve and maintain the State standards (H&SC sections 40001 and 41500).

E. PUBLIC PROCESS

The H&SC requires the Board to adopt criteria for designating areas with respect to the State standards. Furthermore, both the H&SC (section 39608) and the designation criteria (CCR, title 17, section 70306) require the Board to review the area designations annually and to redesignate areas as new information becomes available. In order to facilitate public comment during the designation review process, ARB staff requested public input in a number of ways.

After ARB staff's initial review of the 2003 through 2005 air quality data, staff noted potential changes to the existing area designations for carbon monoxide, PM10, and PM2.5, as well as changes for ozone resulting from the Board's adoption of a new State 8-hour ozone standard. After these preliminary reviews, staff contacted the affected districts to discuss the results of the review. These discussions included the basis for the designation change, additional information relevant to the designation change, and an opportunity for district input. Furthermore, staff encouraged districts to submit any other information they would like considered. Staff also maintained a web-based subscriber notification process or listserve. For those who subscribe, the listserve provides automatic electronic updates related to area designation issues.

On July 10, 2006, staff announced a public workshop scheduled for July 24, 2006. Staff notified subscribers to our listserve about the workshop, as well as subscribers to the Environmental Justice and State Implementation Plan (SIP) listserves. The

workshop announcement included a discussion of the staff's proposed amendments to the area designations based on the most recent three complete calendar years of air quality data: 2003 through 2005. Approximately 20 people attended the July 24, 2006, workshop.

The proposed amendments described in this staff report incorporate comments received from the public. The Board is scheduled to consider these amendments at a public hearing in November 2006.

CHAPTER II

AREA DESIGNATION CRITERIA

A. INTRODUCTION

This chapter provides a summary of the existing designation criteria. The following sections describe the general provisions of the designation criteria, the area designation categories, the data requirements, the size of the designated areas, and the requirements for identifying highly irregular or infrequent events. The full text of the designation criteria is included as Attachment A.

B. GENERAL PROVISIONS OF THE DESIGNATION CRITERIA

The designation criteria describe the procedures the Board must use in determining an area's designation status with respect to the State standards. In summary, the designation criteria specify:

- The requirements for each area designation category;
- The data the Board will use for making the area designations;
- How the Board will determine the size of a designated area; and
- The requirement for an annual review of the area designations by the Board's Executive Officer.

C. DESIGNATION CATEGORIES

In determining which designation category is appropriate for an area, it is essential to understand the difference between an *exceedance* and a *violation*. An exceedance is any concentration that is higher than the level of the State standard. In contrast, violations are a subset of the exceedances. A violation is any exceedance (concentration above the level of the State standard) that is not affected by a highly irregular or infrequent event, and therefore, cannot be excluded from the area designation process (refer to discussion in Section F, below).

The designation criteria specify four designation categories: nonattainment, nonattainment-transitional, attainment, and unclassified. The Board will designate an area as *nonattainment* for a pollutant if air quality data show that a State standard for the pollutant was violated at least once during the previous three calendar years. As explained above, exceedances that are affected by highly irregular or infrequent events are not considered violations of a State standard and are not used as a basis for designating an area as nonattainment.

The *nonattainment-transitional* designation is a subcategory of nonattainment. The Board will designate an area as nonattainment-transitional for a pollutant other than ozone if air quality data show that a State standard for that pollutant was violated two or fewer times at each of the sites in the area during the most recent calendar year. In addition, an evaluation of recent air quality trends and meteorological and emissions data must show that air quality in the area either has stabilized or has improved. Finally, each site in the area must be expected to reach attainment for the pollutant within three years.

In contrast to the nonattainment-transitional requirements for other pollutants, the ozone nonattainment-transitional requirements are specified in State law (H&SC section 40925.5). The H&SC specifies that the ozone nonattainment-transitional designation be made by district area (rather than air basin, county, or other geographic area) and be based on exceedances, not violations. Because ozone nonattainment-transitional is based on exceedances, all measurements above the level of the State ozone standard are considered and none are excluded. Furthermore, the H&SC specifies that only nonattainment districts may be designated as nonattainment-transitional for ozone.

Specifically, H&SC section 40925.5 specifies that a nonattainment district (or the portion of a district within an air basin) is designated as nonattainment-transitional for ozone if air quality data show three or fewer exceedances of the State standard at each site within the district (or portion of the district) during the most recent calendar year. Because the ozone nonattainment-transitional designation is based on a single year of data, it can be unstable due to year-to-year changes in meteorology. To provide more stability, the designation criteria allow for a review of data collected during the current calendar year. If data for the current year show more than three exceedances at any monitoring location in the area, thereby ensuring the district would not qualify as nonattainment-transitional during the next annual review, the district remains designated as nonattainment in the area designation regulations. This approach prevents districts from going in and out of nonattainment-transitional from one year to the next.

Finally, unlike the nonattainment-transitional designation for other pollutants, the redesignation of an ozone nonattainment district area as nonattainment-transitional occurs by operation of law. Although the redesignation occurs by operation of law, the Board confirms the change based on the guidelines set forth in the designation criteria. The Board also makes sure the area designation regulations are amended to reflect the ozone nonattainment-transitional designation.

In contrast to nonattainment and nonattainment-transitional, the Board will designate an area as *attainment* for a pollutant if data show the State standard for that pollutant was not violated during the previous three calendar years. As described earlier, exceedances affected by highly irregular or infrequent events are not considered violations, and therefore, are not considered in designating areas as attainment. As a

result, an area can have measured concentrations that are higher than the level of the State standard and still be designated as attainment. Finally, the Board will designate an area as *unclassified* for a pollutant if the available data do not support a designation of nonattainment or attainment.

D. DATA REQUIREMENTS

To the extent possible, the Board makes area designations for each pollutant based on the most recent ambient air quality data. The air quality data must be *data for record*, which are those air quality data that satisfy specific siting and quality assurance procedures established by the U.S. EPA and adopted by the Board. Generally, data for record are those data collected by or under the direction of the Board or the districts. Air quality data from other sources may also qualify as data for record, as long as the same requirements are met. For area designation purposes, air quality measurements and statistics are rounded to the precision of the State standard before being compared with the State standard. The rounding convention is summarized in Attachment D.

When adequate and recent air quality data are not available, the Board may use other types of information to determine an appropriate area designation. These other types of information may include historical air quality data, emissions data, meteorological data, topographical data, and data relating to the characteristics of population or emissions.

E. SIZE OF DESIGNATED AREA

The size of the area designated for a pollutant may vary depending on the nature of the pollutant, the location of contributing emission sources, meteorology, and topographic features. Normally, an air basin is the area designated for pollutants with a regional impact: ozone, PM10, PM2.5, nitrogen dioxide, sulfates, and visibility reducing particles. A county (or the portion of a county located within an air basin) is normally the area designated for pollutants with a more localized impact: carbon monoxide, sulfur dioxide, lead, and hydrogen sulfide. In both cases, however, the Board may designate a smaller area if the Board finds that the smaller area has distinctly different air quality. This finding is based on a review of the air quality data, meteorology, topography, and the distribution of population and emissions. In designating a smaller area as nonattainment, the sources with emissions that contribute to a violation must be included within the designated area. In defining a smaller designation area, the Board uses political boundary lines whenever possible.

F. HIGHLY IRREGULAR OR INFREQUENT EVENTS

While area designations for State standards are based on ambient air quality data, the designation criteria provide for excluding certain high values. In particular, the designation criteria provide for excluding exceedances affected by *highly irregular or infrequent events* because it is not reasonable to mitigate these exceedances through the regulatory process. Appendix 2 to the designation criteria (refer to Attachment A) defines three types of highly irregular or infrequent events:

- Extreme concentration events;
- Exceptional events; and
- Unusual concentration events.

An *extreme concentration event* is identified by a statistical procedure that calculates the concentration that is not expected to be exceeded more than once per year, on average. This value is also referred to as the Expected Peak Day Concentration or EPDC. Adverse meteorology is one potential cause of an extreme concentration event. However, a specific, identifiable cause is not necessary for an exceedance to be identified as an extreme concentration.

In practice, a pollutant-specific EPDC is calculated for each monitoring site using air quality data measured at the site during the most recent three calendar years. The EPDC value is rounded to the precision of the State standard and then compared with the air quality measurements from the same site, which are also rounded to the precision of the State standard. Air quality measurements that exceed the State standard, and that are higher than the rounded EPDC value, are excluded from the area designation process. These exceedances are not considered violations of the State standard. However, air quality measurements that exceed the State standard and are equal to or lower than the rounded EPDC value are not excluded from the area designation process. These values are considered violations of the State standard.

In contrast to an extreme concentration event, an *exceptional event* is an exceedance of a State standard that is caused by a specific, identifiable event that is beyond reasonable regulatory control. An exceptional event may be caused by an act of nature (for example, a forest fire or a severe windstorm) or it may be of human origin (for example, a chemical spill or industrial accident).

Finally, an *unusual concentration event* is an unexpected or atypical exceedance of a State standard that cannot be identified as an extreme concentration event or an exceptional event. Unusual concentration events are identified only for areas already designated as attainment or unclassified at the time of the exceedance. In identifying

such events, the Executive Officer must make specific findings based on relevant information. Generally, unusual concentration events are identified in areas with limited air quality data, and therefore, uncertainty as to what level of concentrations are expected to occur.

The unusual concentration event allows a wait-and-see approach in making nonattainment designations. However, there is a time limit. An area may retain its attainment or unclassified designation based on the exclusion of one or more exceedances affected by an unusual concentration event for up to three consecutive years. If an exceedance occurs during the fourth year, the area is redesignated as nonattainment, unless the exceedance can be excluded as an extreme concentration event or an exceptional event. The idea behind this time limit is that within three years, the air quality data record should be complete enough to determine whether the area is attainment or nonattainment.

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CHAPTER III

PROPOSED AMENDMENTS TO THE AREA DESIGNATIONS

A. INTRODUCTION

This chapter describes the area designation process and the proposed changes to the area designation regulations. As required by H&SC section 39608, the Board updates the area designations each year, based on a review of data from the most recent three calendar years. This year's review is based on air quality data collected during the calendar years 2003 through 2005. The Board's update of the area designations includes changes warranted to existing area designations. These proposed changes amend the existing CCR, title 17, sections 60201, 60202, 60205, and 60210. Once adopted by the Board, the proposed amendments must be approved by the Office of Administrative Law before they become effective, with the exception of those that occur by operation of law.

Based on data collected during 2003 through 2005, the staff proposes changes to the area designations for four pollutants, as summarized below. Changes in area designation status are appropriate for ozone, CO, PM10, and PM2.5. No changes are proposed for the remaining six pollutants: nitrogen dioxide, sulfur dioxide, lead, sulfates, hydrogen sulfide, and visibility reducing particles.

- *Proposed Changes to Ozone Area Designations (section 60201):*
  - *Redesignate Inyo County in the Great Basin Valleys Air Basin as Nonattainment.*
  - *Redesignate the Lake Tahoe Air Basin as Unclassified.*
  - *Confirm the redesignation of the North Central Coast Air Basin as Nonattainment that occurred by operation of law.*
  - *Redesignate the North Coast Air Basin portion of Sonoma County as Nonattainment.*
  - *Redesignate Siskiyou County in the Northeast Plateau Air Basin as Nonattainment.*
  - *Redesignate Lassen and Modoc Counties in the Northeast Plateau Air Basin as Unclassified.*
  - *Confirm the redesignation of seven counties in the Sacramento Valley Air Basin (Butte, Shasta, Solano (SVAB portion), Sutter, Tehama, Yolo, and Yuba) as Nonattainment that occurred by operation of law.*
  - *Redesignate San Luis Obispo County in the South Central Coast Air Basin as Nonattainment.*

- *Proposed Changes to Carbon Monoxide Area Designations (section 60202):*
  - ➢ *Redesignate Imperial County in the Salton Sea Air Basin as Attainment.*

- *Proposed Changes to PM10 Area Designations (section 60205):*
  - ➢ *Redesignate the North Coast Air Basin portion of Sonoma County as Attainment.*

- *Proposed Changes to PM2.5 Area Designations (section 60210):*
  - ➢ *Redesignate San Luis Obispo County in the South Central Coast Air Basin as Attainment.*

B. DESIGNATION PROCESS

The area designations are based on air quality data for record as defined in section 70301 of the designation criteria (for reference, the full text of the designation criteria is contained in Attachment A). Data for record must meet established siting and quality assurance procedures. Generally, data for record are those data collected by the Board or the districts. However, data from other sources may also be considered, as long as they satisfy the established procedures.

The process used to designate an area with respect to a State standard is generally the same for each of the ten pollutants:

- Gather data for the three-year period for each site in the area.
- Evaluate data representativeness and data completeness for each site.
- Identify and exclude exceedances affected by highly irregular or infrequent events.
- Tabulate the number of exceedances and violations by site.
- Determine the designation value for each site in the area.
- Determine the designation value for the area.
- Determine the appropriate area designation category.

Determining the designation value is the most critical part of the designation process because the designation value determines, in large part, the area designation. More detail about the designation value and how it is determined, is given in the following section.

C. DESIGNATION VALUE

The designation value is the measured concentration that is used to determine the designation status of a given area. In practice, the designation value is the highest measured concentration that remains after excluding measurements identified as affected by highly irregular or infrequent events.

Under Appendix 2 to the designation criteria, there are three types of highly irregular or infrequent events: extreme concentration events, exceptional events, and unusual concentration events. Each of these types of events is described more fully in Chapter II. The extreme concentration event is the most frequently used method for excluding values from the designation process. Using a statistical process, ARB staff computes a site-specific and pollutant-specific value for each State standard averaging time. This computed value represents the concentration not expected to be exceeded more than once per year, on average, based on the distribution of data for the site. The resulting value, the Expected Peak Day Concentration (EPDC), is rounded to the precision of the State standard before being used. The measured or averaged (for example, 8-hour average) pollutant concentrations are also rounded and compared with the rounded EPDC. Any rounded concentrations that are higher than the rounded EPDC are excluded as extreme concentration events. Although the EPDC is designed to exclude an average of one exceedance per year, over the long-term, it will not necessarily exclude one exceedance per year during any particular three-year period. Depending on the distribution of the data, the EPDC will sometimes exclude more than one exceedance per year and sometimes less than one exceedance per year. In many cases, the EPDC will not exclude any exceedances during a given three-year period. Once the extreme concentrations are excluded from the database, the highest remaining concentration becomes the designation value for the site, unless it is identified as an exceptional event or unusual concentration event.

For example, consider a site with an 8-hour EPDC for ozone of 0.0796 ppm, and the four highest measured 8-hour average concentrations of 0.0832 ppm, 0.0812 ppm, 0.0807 ppm, and 0.0801 ppm during the prior three years. The ozone EPDC is rounded to 0.080 ppm (3 decimal places, which is the precision of the State 8-hour ozone standard; refer to Attachment D for a more detailed discussion of the rounding convention used in area designations). The four ozone measurements are also rounded to the precision of the State 8-hour standard (three digits), thus becoming 0.083 ppm, 0.081 ppm, 0.081 ppm, and 0.080 ppm, respectively. The 0.083 ppm average and the two 0.081 ppm averages are higher than the rounded EPDC. Therefore, these three rounded 8-hour averages are excluded from the area designation process. The next highest rounded 8-hour average, 0.080 ppm, is equal to or lower than the rounded EPDC, so it is not excluded. Since 0.080 ppm is the highest value not excluded, it becomes the 8-hour ozone designation value for the site, unless it can be excluded as an exceptional event or unusual concentration event.

A designation value is determined for each pollutant, for each monitoring site in an area. The highest designation value for any site in the area becomes the designation value for the area. When there is more than one standard for a single pollutant, a designation value is determined for each standard averaging time. For example, there is both a 1-hour and an 8-hour State standard for ozone. As a result, there is a 1-hour designation value, as well as an 8-hour designation value. The final area designation reflects the more stringent designation category of the two averaging periods. Using ozone as an example, consider an area with a 1-hour ozone designation value that is lower than the standard, indicating attainment. In contrast, the 8-hour designation value for the same area may be higher than the State 8-hour standard, indicating nonattainment. In this case, the area would be designated as nonattainment for ozone because that is the more stringent designation category.

When there are less than three complete years of air quality data for a site, the EPDC may not be valid for area designation purposes. If the EPDC is not valid, no measurements are excluded as extreme concentration events. In this case, the designation value for a site is simply the highest measured concentration during the specified three-year period, after excluding measurements affected by exceptional events or unusual concentration events.

D. OZONE

Based on data collected during 2003 through 2005, the staff recommends a change in the ozone designation for fifteen areas. As summarized in Table III-1, twelve areas qualify for redesignation as nonattainment, and three areas for redesignation as unclassified. As described previously, the change from ozone nonattainment to nonattainment-transitional occurs by operation of law. Similarly, the change from ozone nonattainment-transitional back to nonattainment also occurs by operation of law. In these two cases, the Board simply confirms the change based on guidelines set forth in the designation criteria, and takes the steps necessary to make sure the change is reflected in the area designation regulations. In contrast, all other designation changes for ozone require Board action.

Currently, there are two State standards for ozone: a 1-hour standard and an 8-hour standard. An area must attain both standards to be designated attainment. If either the 1-hour or 8-hour standard is violated, the area is nonattainment or nonattainment-transitional. The State 1-hour standard is 0.09 ppm, not to be exceeded. This standard has been in place for a number of years, and the Board reaffirmed the standard in April 2005. At the same time, the Board approved a new 8-hour standard of 0.070 ppm, not to be exceeded. This longer averaging time standard is designed to protect against the more chronic health impacts of longer-term ozone exposure. The State 8-hour ozone standard became effective May 17, 2006, and this is the first time the new 8-hour standard is being considered in the area designation process. Furthermore, because the 8-hour standard is more health-protective than the 1-hour standard, it tends to drive, or dictate, the ozone area designations.

TABLE III-1
Proposed Area Designation Changes for the State Ozone Standards

Air Basin / Area	Current Designation	Proposed Designation
Great Basin Valleys Air Basin (Inyo County)	U	N
Lake Tahoe Air Basin	A	U
North Central Coast Air Basin	NA-T	N
North Coast Air Basin (Sonoma County portion)	A	N
Northeast Plateau Air Basin		
Lassen and Modoc Counties	A	U
Siskiyou County	A	N
Sacramento Valley Air Basin		
Butte County	NA-T	N
Shasta County	NA-T	N
Sutter and Yuba Counties	NA-T	N
Tehama County	NA-T	N
Yolo and Solano Counties	NA-T	N
South Central Coast Air Basin (San Luis Obispo County)	A	N

A = Attainment, N = Nonattainment, NA-T = Nonattainment-Transitional, and U = Unclassified.

Table III-2 provides a summary of the status of each area of California with respect to both the 1-hour and 8-hour State ozone standards. For many areas of the State, there is no change in designation based on consideration of the new 8-hour standard. In general, the large urban areas of the State, such as the South Coast, San Joaquin Valley, and San Francisco Bay Area Air Basins, as well as some more rural areas, such as the Mountain Counties and Mojave Desert Air Basins, continue to be nonattainment. All of these areas have long been designated as nonattainment, based on the 1-hour ozone standard. Since the areas also violate the 8-hour standard, they will continue to be designated as nonattainment for ozone. As shown in Table III-2 these nonattainment areas tend to violate the State 8-hour standard by a greater margin than the 1-hour standard. In addition, Lake County Air Basin, which has been designated as attainment based on the State 1-hour ozone standard since the designations were initially made in 1989, attains the 8-hour standard, as well. As a result, this area will continue to be designated as attainment for ozone.

TABLE III-2

2006 Proposed Area Designations for State Ozone Standards[1]

		8-Hour Standard (0.070 ppm)		1-Hour Standard (0.09 ppm)		
Air Basin	Area Included	DV (ppm)	Designation Status	DV (ppm)	Designation Status	***Proposed Designation***
Great Basin Valleys	Alpine County	no data	U	no data	U	***U***
	Inyo County	0.087	N	0.09[2]	U	***N***
	Mono County[3]	0.095	N	0.10	N	***N***
Lake County	Entire Air Basin	0.066	A	0.08	A	***A***
Lake Tahoe[4]	Entire Air Basin	0.069	U	0.09	U	***U***
Mojave Desert	Entire Air Basin	0.119	N	0.14	N	***N***
Mountain Counties	Plumas County[5]	0.068	U	0.07	U	***U***
	Sierra County[6]	no data	U	no data	U	***U***
	Tuolumne County	0.090	N	0.10	NA-T	***N***
	Remainder of Air Basin	0.115	N	0.13	N	***N***
North Central Coast	Entire Air Basin	0.084	N	0.10	NA-T	***N***
North Coast	Sonoma County	0.080	N	0.09[7]	U	***N***
	Remainder of Air Basin	0.062	A	0.08	A	***A***
Northeast Plateau	Lassen County	no data	U	no data	A[8]	***U***
	Modoc County	no data	U	no data	A[8]	***U***
	Siskiyou County	0.074	N	0.08	A	***N***
Sacramento Valley	Butte County	0.092	N	0.10	NA-T	***N***
	Colusa County	0.074	NA-T	0.08	NA-T	***NA-T***
	Glenn County	0.075	NA-T	0.08	NA-T	***NA-T***
	Shasta County	0.096	N	0.13	NA-T	***N***
	Sutter/Yuba Counties	0.082	N	0.09	NA-T	***N***
	Tehama County	0.090	N	0.10	NA-T	***N***
	Yolo/Solano Counties	0.087	N	0.10	NA-T	***N***
	Remainder of Air Basin	0.111	N	0.13	N	***N***
Salton Sea	Entire Air Basin	0.116	N	0.13	N	***N***
San Diego	Entire Air Basin	0.090	N	0.11	N	***N***
SF Bay Area	Entire Air Basin	0.090	N	0.12	N	***N***
San Joaquin Valley	Entire Air Basin	0.121	N	0.14	N	***N***
South Central Coast	San Luis Obispo County	0.080	N	0.09	NA-T	***N***
	Remainder of Air Basin	0.100	N	0.12	N	***N***
South Coast	Entire Air Basin	0.147	N	0.17	N	***N***

(1) Based on ambient ozone data collected druing 2003, 2004, and 2005. DV = Designation Value, A = Attainment, N = Nonattainment, NA-T = Nonattainment-Transitional, and U = Unclassified.

(2) Although the designation value does not violate the 1-hour standard, Inyo County qualifies as unclassified because the Death Valley monitoring site is not located in an area of expected high concentrations.

(3) The Mammoth Lakes monitoring site closed in 2002, and the given designation values reflect 2000 through 2002 data. The County will continue to be designated as nonattainment until an equivalent site is established.

(4) Although the designation values do not violate the State standards, data are incomplete for all sites located in the Lake Tahoe Air Basin during 2003 through 2005.

(5) Although the designation values do not violate the State standards, Plumas County qualifies as unclassified because the Quincy monitoring site is not located in an area of expected high concentrations.

(6) There is no monitoring site located in Sierra County.

In contrast, there will be a change in ozone designation for a large number of areas located throughout the State, based primarily on consideration of the new State 8-hour standard. For example, the North Central Coast Air Basin and seven counties (covering five districts) in the Sacramento Valley Air Basin were recently designated as nonattainment-transitional for ozone, based on the 1-hour standard. Although these areas would still qualify as nonattainment-transitional based only on the 1-hour standard, they are nonattainment based on the more health-protective 8-hour standard. As a result, the areas will be designated as nonattainment for the State ozone standards. Additional discussion of the nonattainment-transitional category is provided in Chapter II.C. All areas with a change in designation status are discussed in the following sections.

1. Great Basin Valleys Air Basin (Inyo County)

Inyo County is located in the southern portion of the Great Basin Valleys Air Basin (GBVAB), and is currently designated as unclassified. The staff recommends the Board redesignate Inyo County as nonattainment.

There is one monitoring site in Inyo County, located at the Death Valley National Monument. The County is currently designated as unclassified for ozone, based on the State 1-hour standard. Although maximum 1-hour concentrations do not violate the State standard, data from the Death Valley monitoring site do not represent the area with the highest expected ozone concentrations and therefore, are not an appropriate basis for an attainment designation. As a result, Inyo County is currently designated as unclassified, based on the 1-hour standard.

In contrast to the 1-hour values, 8-hour ozone concentrations at the Death Valley National Monument site during 2003 through 2005 show multiple exceedances of the State 8-hour standard: 31 exceedance days during 2003, 28 during 2004, and 47 during 2005. One of these exceedances is excluded from the designation process because it is higher than the EPDC value of 0.090 ppm. However, the remaining 105 exceedances are considered violations of the standard, and the designation value for the County area is 0.087 ppm, which is well above the level of the State 8-hour ozone standard. Based on these violations, the staff recommends the Board redesignate Inyo County in the GBVAB as nonattainment for the State ozone standards.

2. Lake Tahoe Air Basin

The Lake Tahoe Air Basin (LTAB) is comprised of the eastern portions of El Dorado and Placer counties. This area is currently designated as attainment, based only on the 1-hour State ozone standard. ARB staff propose the Board redesignate the LTAB as unclassified for the State ozone standards. This proposal is based on data for sites located in the LTAB, and the exclusion of 2 exceedances measured at one of these sites as unusual concentration events. The reasons for the staff proposal are

discussed below.

Before moving on to a discussion of the LTAB ozone data, it is important to note that during previous years, a monitoring site located at Echo Summit was used in designating the LTAB because it was thought the monitoring site was located in the LTAB. However, recent evaluation of the site location using GIS mapping techniques indicates the Echo Summit site is actually located within the Mountain Counties Air Basin. Historically, in determining area designations, the Board has not used monitoring data from a site located outside the designated area. Therefore, ARB staff proposes the Echo Summit data not be considered in making an area designation for the LTAB.

Without the Echo Summit data, 2003 through 2005 ozone data for sites located within the LTAB are very limited, presenting an unique situation in this area. During this time period, three sites operated within the LTAB: South Lake Tahoe-Sandy Way (Sandy Way), Tahoe City-Lake Forest Road (Tahoe City), and South Lake Tahoe-Airport Road (Airport Road). None of the three sites have complete data for the three-year period. The Sandy Way site operated from January 2003 through April 2004, when the site was closed. The Airport Road site began operation in June 2005 as a replacement for Sandy Way, and it continues to operate. However, less than one year of data are currently available. Finally, the Tahoe City site operated from mid-March 2003 through the end of March 2004, as part of the Lake Tahoe Deposition Study.

Based on data for these three sites, the 1-hour ozone designation values for the LTAB sites are 0.07 ppm for the Airport Road site, 0.08 ppm for the Sandy Way site, and 0.09 ppm for the Tahoe City site. None of these values exceed the State 1-hour ozone standard. However, because none of the three sites have complete data under the provisions of the designation criteria, the LTAB would not qualify as attainment based only on the 1-hour standard. Instead, the LTAB would qualify as unclassified for the 1-hour standard.

Based on 8-hour average concentrations, neither the Airport Road nor Sandy Way site shows an exceedance of the State standard In contrast, data for the Tahoe City site show two exceedances of the 8-hour standard during 2003, both at a level of 0.071 ppm, which is just slightly above the level of the State standard. Because data for the Tahoe City site are not complete, a valid EPDC cannot be calculated, and the exceedances cannot be excluded as extreme concentration events. However, staff recommends that they be excluded as unusual concentration events.

Under Appendix 2 of the designation criteria, an unusual concentration event is defined as an event which causes an anomalous exceedance of a State standard and which cannot be identified as an extreme concentration event or an exceptional event. Unusual concentration events may be identified only in areas already designated as attainment or unclassified at the time of the exceedance. The LTAB is currently designated as attainment, based on the 1-hour standard. Furthermore, previous

historical data for the Sandy Way site from 1995 to 2003 (Table III-3) shows that 8-hour ozone concentrations in the LTAB have been improving and that based on the most recent complete three year period (2001 to 2003), the LTAB would have qualified for attainment for the State 8-hour ozone standard.

TABLE III-3
8-Hour Ozone summary Statistics for the South Lake Tahoe-Sandy Way Site

	8-Hour Ozone Statistics		
Year	# Exceedance Days	EPDC (ppm)	Designation Value (ppm)
1995	5	0.078	0.077
1996	2	0.079	0.079
1997	1	0.077	0.074
1998	7	0.077	0.077
1999	3	0.077	0.077
2000	2	0.077	0.077
2001	2	0.075	0.074
2002	1	0.075	0.072
2003	0	0.075	0.069

Although two exceedances were measured at the Tahoe City site, no exceedances were recorded during the same time frame at the Sandy Way site. Therefore, the Tahoe City exceedances appear to be limited to the local area, as required under the procedure for identifying unusual concentration events. In addition, due to the short-term duration of the monitoring at Tahoe City, an assessment cannot be made regarding the representativeness of these exceedances. Therefore, ARB staff recommends the Board identify the two 8-hour ozone exceedances at the Tahoe City site as unusual concentration events and exclude them from the area designation process.

Based on the remaining data, the staff recommends the Board redesignate the LTAB as unclassified for the State ozone standards. The staff also recommends the Board direct staff to work with the local air pollution control districts and other interested public agencies and groups in ensuring that there is long-term monitoring in the LTAB, either at the current Airport Road site or another suitable location. These long-term data are needed for future area designation reviews.

3. North Central Coast Air Basin

Three counties, Monterey, San Benito, and Santa Cruz, comprise the North Central Coast Air Basin (NCCAB). Currently, the NCCAB is designated as nonattainment-transitional. As described earlier in this chapter, the change from ozone nonattainment-transitional back to nonattainment occurs by operation of law. Therefore, the staff recommends the Board confirm the redesignation of the NCCAB as nonattainment and amend the area designation regulations to reflect this change

The site with the highest ozone concentrations in the NCCAB is the Pinnacles National Monument site in San Benito County, and the air basin is currently designated as nonattainment-transitional, based on data for the 1-hour State ozone standard. Data collected during 2005 at the Pinnacles National Monument site show two exceedances of the 1-hour standard. With a 1-hour designation value of 0.10 ppm, the NCCAB would again qualify as nonattainment-transitional based only on the 1-hour standard.

In contrast to the 1-hour data, 8-hour ozone data for the Pinnacles site show multiple exceedances of the more health-protective State 8-hour standard: 25 exceedance days in 2003, 11 in 2004, and six in 2005. Based on the 8-hour EPDC value of 0.084 ppm, four exceedances are excluded as extreme concentration events, leaving a total of 38 violations during the 3-year period. Although the Pinnacles monitoring site has the highest designation value and the greatest number of 8-hour violation days, the Hollister and Scott's Valley sites in Santa Cruz County also have designation values above the level of the State 8-hour ozone standard.

4. North Coast Air Basin (Sonoma County Portion)

The NCAB is comprised of Del Norte County, Humboldt County, Mendocino County, Trinity County, and the northern portion of Sonoma County. The entire North Coast Air Basin (NCAB) is currently designated as attainment, based on the 1-hour State ozone standard. The staff recommends the Board redesignate the northern Sonoma County portion of the NCAB as nonattainment for the State ozone standards.

Based on data collected during 2003 through 2005, Del Norte, Humboldt, Mendocino, and Trinity counties continue to show attainment of the 1-hour standard. Furthermore, available data indicate this four county area also attains the State 8-hour standard. Therefore, the staff does not recommend a designation change for these four counties.

In contrast, data for the Healdsburg-Municipal Airport monitoring site in northern Sonoma County do not show attainment of either the 1-hour or 8-hour State ozone standard. During 2003 through 2005, the Healdsburg data show no exceedances of the State 1-hour ozone standard. However, the data for 2005 are incomplete, with data missing from May 15 through August 23. Under the designation criteria, data for the three-year period must be complete during the high concentration season to qualify as

attainment. Because data are missing for most of the summer during 2005, northern Sonoma County does not qualify as attainment for the State 1-hour standard. Instead, the area would qualify as unclassified.

In contrast to the 1-hour data, the Healdsburg site shows one exceedance of the State 8-hour standard during 2003 and one during 2004. While the number of exceedance days is small, the incomplete 2005 data preclude the calculation of a valid 8-hour EPDC. In addition, based on a review of the long-term data at this site, these exceedances are not considered either unusual or exceptional events. Therefore, the 8-hour exceedance days cannot be excluded, and they are considered violations of the State standard. Because there were no exceedances during 2005, it might appear the northern Sonoma County would qualify as nonattainment-transitional for ozone. However, the data are not complete. In addition, State law (H&SC section 40925.5) specifies that only nonattainment districts may be designated as nonattainment-transitional for ozone by operation of law. Because northern Sonoma County is currently designated as attainment, if does not qualify as nonattainment-transitional under the requirements of H&SC section 40925.5.

5. Northeast Plateau Air Basin

The Northeast Plateau Air Basin (NEPAB) is located in the northeastern part of California and is comprised of Lassen County, Modoc County, and Siskiyou County. Currently, monitoring data are available for only one site, located in the town of Yreka in Siskiyou County. Based on data from this monitor, the entire NEPAB is currently designated as attainment for ozone, based on the State 1-hour standard.

a. Siskiyou County

ARB staff recommend the Board redesignate Siskiyou County as nonattainment for the State ozone standards.

During 2003 through 2005, data from the Yreka-Foothill Drive monitoring site show no exceedances of the State 1-hour ozone standard. The designation value of 0.08 ppm is below the level of the 1-hour standard, and data for the three-year period are both representative and complete under the requirements of the designation criteria. Therefore, the NEPAB would qualify as attainment, based only on the State 1-hour standard.

Based on the State 8-hour standard, the Yreka data show three exceedances during 2003, one exceedance during 2004, and no exceedances during 2005. None of these exceedances are excluded by the EPDC nor are they considered unusual events, and therefore all four exceedances are considered violations of the standard. The designation value for the site is 0.074 ppm, which is above the level of the State 8-hour standard. Because there were no exceedances during 2005, it might appear the Siskiyou County would qualify as nonattainment-transitional for ozone. However, State

law (H&SC section 40925.5) specifies that only nonattainment districts may be designated as nonattainment-transitional for ozone by operation of law. Because Siskiyou County is currently designated as attainment, if does not qualify as nonattainment-transitional under the requirements of H&SC section 40925.5. Therefore, based on the violations that occurred during 2003 and 2004, the staff recommends the Board redesignate Siskiyou County as nonattainment for the State ozone standards.

b. Lassen and Modoc Counties

Lassen and Modoc counties are also located in the NEPAB. Because no monitoring data are available for these two counties, the staff recommends the Board redesignate both Lassen County and Modoc County as unclassified for the State ozone standards.

Lassen and Modoc counties in the NEPAB are currently designated as attainment, based on 1-hour ozone monitoring data from the Yreka-Foothill Drive monitoring site in Siskiyou County. Because Yreka is the largest populated area in the NEPAB and represents an area of expected high concentrations within the air basin, ARB staff would expect concentrations in Lassen County and Modoc County to be lower than those measured in Yreka. Therefore, it is appropriate to use the Yreka data as a basis for designating Lassen and Modoc counties as attainment.

In contrast, Yreka is not an appropriate site for designating Lassen and Modoc counties as nonattainment. As discussed above, ARB staff would expect concentrations measured in Lassen and Modoc counties to be lower than those measured at Yreka. However, although the Yreka monitor is non-attainment for the 8-hour standard, there are no monitoring sites located in Lassen and Modoc counties. Therefore, staff cannot determine how much lower their concentrations are, or whether they exceed the level of the standard. Based on the lack of data for Lassen and Modoc counties, the staff recommends these two counties be designated as unclassified for the State ozone standards.

6. Sacramento Valley Air Basin

The Sacramento Valley Air Basin (SVAB) is located in the north central portion of California and is comprised of the following areas: Butte County, Colusa County, Glenn County, western Placer County, Sacramento County, Shasta County, eastern Solano County, Sutter County, Tehama County, Yolo County, and Yuba County. During 2005, based on 2002 through 2004 data, a number of SVAB districts qualified as nonattainment-transitional. As a result, Butte, Shasta, Solano (SVAB portion), Sutter, Tehama, Yolo, and Yuba counties were redesignated by operation of law. Colusa and Glenn counties remained designated as nonattainment-transitional, while Sacramento and Placer (SVAB portion) counties remained designated as nonattainment. Based on the most recent 2003 to 2005 data, the following areas have a change in designation status.

a. Butte County

Butte County comprises the Butte County Air Quality Management District and is currently designated as nonattainment-transitional for ozone. ARB staff recommends the Board confirm the change in designation for Butte County from nonattainment-transitional to nonattainment and amend the area designation regulations to reflect this change that occurred by operation of law.

During 2003 through 2005, monitoring data are available for sites in Chico and Paradise. Data for Chico-Manzanita do not show any exceedances of the State 1-hour standard during the three-year period. However, a limited number of exceedances were measured at the Paradise-Airport Road site during 2003 and 2004; no exceedances occurred at this site during 2005. Because there were no exceedances during 2005, and data are both representative and complete, Butte County would qualify as nonattainment-transitional for the 1-hour State ozone standard.

In contrast to the 1-hour standard, both Butte County sites show violations of the State 8-hour standard during 2003 through 2005. Again, the highest concentrations and greatest number of exceedances were measured at the Paradise site. There were 44 8-hour exceedance days during 2003, 37 days during 2004, and 31 days during 2005. One of these exceedances is excluded by the EPDC as an extreme concentration event, leaving 111 violations of the State 8-hour standard. The designation value for the Paradise site is 0.092 ppm, which is well above the level of the standard.

Based on these data, Butte County no longer qualifies as nonattainment-transitional for the ozone, and the area reverts to nonattainment, by operation of law.

b. Shasta County

Shasta County comprises the Shasta County Air Quality Management District and is currently designated as nonattainment-transitional for ozone. ARB staff recommend the Board confirm the change in designation for Shasta County from nonattainment-transitional to nonattainment and amend the area designation regulations to reflect this change that occurred by operation of law.

During 2003 through 2005, monitoring data are available for three sites in Shasta County. The Anderson-North Street and Redding-Health Department sites are the high sites for the area. Both sites show 3 or fewer exceedances of the 1-hour standard during 2005, and data for both sites are representative and complete under the designation criteria. As a result, Shasta County would qualify as nonattainment-transitional, based only on the 1-hour standard.

In contrast, both the Anderson and Redding sites show numerous violations of the

State 8-hour ozone standard during all three years. Specifically, the Anderson site had 74 violation days during 2003 through 2005, while the Redding site had 32 violation days. Both sites have an 8-hour designation value of 0.096 ppm, which is well above the level of the State 8-hour ozone standard.

Based on these data, Shasta County no longer qualifies as nonattainment-transitional for ozone, and the area reverts to nonattainment, by operation of law.

c. Sutter and Yuba Counties

Sutter and Yuba counties comprise the Feather River Air Quality Management District (Feather River AQMD) and is currently designated as nonattainment-transitional for ozone. ARB staff recommend the Board confirm the change in designation for Sutter and Yuba counties from nonattainment-transitional to nonattainment and amend the area designation regulations to reflect this change that occurred by operation of law.

During 2005, the Feather River AQMD, which comprises Sutter and Yuba counties, was redesignated as nonattainment-transitional for the State 1-hour ozone standard. This redesignation was based on data for the Yuba City monitoring site, which is located in Sutter County. There is no ozone monitoring site located in Yuba County. However, the two most populated areas in the two counties, Yuba City in Sutter County and Marysville in Yuba County, form a contiguous urbanized area, separated only by the Feather River. Because the two towns are so close in proximity, the Yuba City site can be used to represent air quality in both counties.

It is important to note that an additional ozone monitoring site in Sutter County is located on the Sutter Buttes. This site was located to monitor ozone transported aloft from other areas. Because of the site's high elevation and its location in an isolated area atop the Sutter Buttes where no people live, this monitor is not appropriate for use in determining an area designation and is not used for this purpose. ARB staff made a similar determination for federal purposes during the designation process for the federal 8-hour ozone standard.

During 2005, representative and complete data for the Yuba City site show no exceedances of the State 1-hour ozone standard. Therefore, the Feather River AQMD would again qualify as nonattainment-transitional, based only on the 1-hour standard.

In contrast to the 1-hour data, ozone data for the Yuba City monitoring site (located in Sutter County) show 18 exceedances of the 8-hour standard in 2003, five exceedances in 2004, and seven in 2005. The EPDC for the three-year period is 0.086 ppm. None of the measured exceedances are above the EPDC value, and therefore, none are excluded from the designation process. This means that all 30 exceedances are considered violations of the State 8-hour standard. The designation value for the Sutter County/Yuba County area is 0.082 ppm, which is above the level of the State 8-hour ozone standard.

Based on these data, the Feather River AQMD no longer qualifies as nonattainment-transitional for ozone, and Sutter and Yuba counties revert to nonattainment, by operation of law.

d. Tehama County

Tehama County comprises the Tehama County Air Pollution Control District and is currently designated as nonattainment-transitional for ozone. ARB staff recommend the Board confirm the change in designation for Tehama County from nonattainment-transitional to nonattainment and amend the area designation regulations to reflect this change that occurred by operation of law.

During 2003 through 2005, monitoring data are available for two sites in Tehama County, Red Bluff-Oak Street and Tuscan Butte. During 2005, data for the Red Bluff site show two exceedances of the State 1-hour standard, while data for the Tuscan Butte site show no exceedances. Data for both sites are representative and complete, as required under the designation criteria for nonattainment-transitional. Therefore, Tehama County would qualify as nonattainment-transitional, for ozone, based only on the State 1-hour standard.

In contrast, both sites show numerous exceedances of the State 8-hour standard. With respect to this standard, Tuscan Butte is the higher site, with an 8-hour designation value of 0.090 ppm and 37 exceedance days during 2003, 51 during 2004, and 35 during 2005. All 123 of these exceedances are considered violations of the 8-hour standard. For comparison, data for the Red Bluff site show 23 violations of the standard, but data for this site are not complete for the three-year period.

Based on monitoring data, Tehama County no longer qualifies as nonattainment-transitional for the State ozone standards, and the County reverts to nonattainment, by operation of law.

e. Yolo and Solano Counties

Yolo County and the SVAB portion of Solano County comprise the portion of the Yolo-Solano Air Quality Management District (Yolo-Solano AQMD) located in the Sacramento Valley Air Basin. Currently, the Yolo-Solano AQMD is designated as nonattainment-transitional for ozone. ARB staff recommend the Board confirm the change in designation for Yolo County and the SVAB portion of Solano County from nonattainment-transitional to nonattainment and amend the area designation regulations to reflect this change that occurred by operation of law.

During 2005, data collected at sites in Davis, Woodland, and Vacaville show fewer than three exceedances of the State 1-hour ozone standard, and all three sites have a designation value of 0.10 ppm. Furthermore, data for all three sites are representative

and complete under the requirements of the designation criteria. Based on these data, the Yolo-Solano AQMD would qualify as nonattainment-transitional, based only on the 1-hour standard.

In contrast, 8-hour ozone data show the greatest number of exceedances at the Vacaville-Ulatis site during the 2003 through 2005 time period: five exceedances in 2003, three in 2004, and five in 2005. All 13 of these exceedances are considered violations of the State 8-hour standard. The Vacaville site also has the highest 8-hour designation value in the Solano County/Yolo County area, at 0.087 ppm. The Davis and Woodland sites also have designation values above the level of the 8-hour standard, 0.082 ppm and 0.086 ppm, respectively.

Because of the number of violations and the designation values above the level of the State 8-hour standard, Yolo County and the SVAB portion of Solano County no longer qualify as nonattainment-transitional for the State ozone standards. Therefore, both counties revert to nonattainment, by operation of law.

7. South Central Coast Air Basin (San Luis Obispo County)

San Luis Obispo County is located in the South Central Coast Air Basin (SCCAB). Currently, the County is designated as attainment, based only on the 1-hour standard. Based on data for sites located in San Luis Obispo County, ARB staff recommend the Board redesignate the County as nonattainment for ozone. Generally, the three counties in SCCAB are treated as separate planning areas for ozone due to difference in topography and air quality. However, because Santa Barbara and Ventura counties are also nonattainment, all three counties share the same designation status and the area designation regulations would reflect the entire SCCAB as a single nonattainment area.

During 2003 through 2005, data show a limited number of exceedances at the two high sites, Atascadero-Lewis Avenue and Paso Robles-Santa Fe Avenue. All of the exceedances are excluded by the EPDC values, so there are no violations of the State 1-hour standard in San Luis Obispo County. Both Atascadero-Lewis Avenue and Paso Robles-Santa Fe Avenue have the same 1-hour designation value of 0.09 ppm. In addition, data for both sites for the three-year period are representative and complete under the designation criteria. Therefore, San Luis Obispo County qualifies as attainment, based only on the State 1-hour standard.

In contrast, the County does not qualify as attainment for the State 8-hour standard. During 2003 through 2005, the highest designation value and the greatest number of exceedances occurred at the Atascadero site. Over the three-year period, there were a total of 16 State 8-hour exceedances. One of these is excluded as an extreme concentration event, leaving 15 violations. The designation value for the site, and therefore the County, is 0.080 ppm, which is above the level of the State 8-hour standard.

E. CARBON MONOXIDE

There are three State carbon monoxide (CO) standards: a 1-hour standard of 20 ppm, and 8-hour standard of 6.0 ppm that applies only in the LTAB, and an 8-hour standard of 9.0 ppm that applies in all other areas of the State. The 8-hour LTAB standard is not to be exceeded while the remaining two CO standards are not to be equaled or exceeded. Based on data collected during 2003 to 2005, one area qualifies for redesignation as attainment.

1. Imperial County (Salton Sea Air Basin)

Imperial County and the central portion of Riverside County comprise the Salton Sea Air Basin (SSAB). Currently, the Riverside portion of the air basin is designated as attainment for the State CO standards. Although the majority of Imperial County is designated as unclassified, the city of Calexico is designated as nonattainment. Based on data collected during 2003 through 2005, the entire Imperial County area qualifies for redesignation as attainment, and ARB staff recommend that the Board redesignate Imperial County as attainment for the State CO standards. With this change, there are no longer any State CO nonattainment areas within California.

The 1-hour State CO standard has not been exceeded anywhere in Imperial County since 1999. During 2003 through 2005, the maximum 1-hour concentration in the County was 12.6 ppm at the Calexico-East monitoring site. This value is below the level of the State 1-hour CO standard.

During 2003 through 2005, the 8-hour CO standard was exceeded only once in Imperial County, at the Calexico-Ethel site. All other 8-hour averages during the three-year period were below the level of the State standard. Over the last decade, all three monitoring sites in Imperial County (Calexico-Ethel, Calexico-East, and El Centro) have shown substantial reductions in CO concentrations. For example, the maximum 1-hour and 8-hour concentrations during 1995 through 1997 were 32 ppm and 22.9 ppm, respectively, compared with maximums of 12.6 ppm and 10.3 ppm during the 2003 through 2005 time period.

The Calexico-Ethel monitoring site represents the high CO site in Imperial County, and the CO data collected at this site during 2003 through 2005 are both representative and complete, as required under the criteria for an attainment designation. Furthermore, the rounded 8-hour EPDC value of 8.4 ppm is valid. Because the one measured exceedance of 10.3 ppm is higher than the rounded EPDC, this exceedance is excluded from the designation process as an extreme concentration, and the designation value for the County is 8.3 ppm.

Because the designation value of 8.3 ppm is below the level of the State 8-hour CO standard, the Imperial County portion of the SSAB qualifies as attainment for CO.

F. SUSPENDED PARTICULATE MATTER (PM10)

There are two State PM10 standards: a 24-hour standard of 50 micrograms per cubic meter ($\mu g/m^3$) and an annual standard of 20 $\mu g/m^3$, calculated as an annual arithmetic mean. These concentrations are not to be exceeded. Based on a review of 2003 through 2005 air quality data, one area qualifies for redesignation as attainment.

1. Sonoma County (North Coast Air Basin portion)

Sonoma County is split between two air basins. The southern portion is located in the San Francisco Bay Area Air Basin and the northern portion is located in the North Coast Air Basin (NCAB). Currently, the northern portion of Sonoma County is designated as nonattainment. ARB staff recommend that the portion of Sonoma County in the NCAB be redesignated as attainment for PM10

In designating an area smaller than an air basin as attainment for PM10, the Board must find that air quality in the smaller area is distinctly different from the rest of the air basin. Sonoma County has long been designated as a separate attainment area for ozone (ARB, April 1989) due to its unique geographic position and meteorological influences.

Northern Sonoma County is separated from the other four counties in the NCAB by mountains, and its air quality is more closely linked with that of the San Francisco Bay Area than that of Mendocino, Humboldt, Trinity, or Del Norte Counties. Furthermore, because of the differences in topography and air quality, the five counties in the NCAB are treated as three separate planning areas. These factors indicate that the PM10 air quality in northern Sonoma County is distinctly different from that in the rest of the NCAB. Data from monitoring sites with complete data Guerneville-Church and Healdsburg have been consistently low showing a three-year annual average maximum of 16 $\mu g/m^3$ and 14 $\mu g/m^3$, respectively, as well as no violations of the 24-hour average PM10 standard.

Based on these data, ARB staff conclude that northern Sonoma County did not have any PM10 violations during the 2003 through 2005 time period and should be designated as a separate attainment area.

G. FINE SUSPENDED PARTICULATE MATTER (PM2.5)

There is one State PM2.5 standard: an annual average of 12 $\mu g/m^3$, calculated as an annual arithmetic mean. This concentration is not to be exceeded. Based on data collected during 2003 through 2005, one area qualifies for redesignation as attainment.

1. San Luis Obispo County (South Central Coast Air Basin)

San Luis Obispo County in the South Central Coast Air Basin (SCCAB) coincides in area with the San Luis Obispo County Air Pollution Control District. Currently, San Luis Obispo County is designated unclassified. The remaining portions of the SCCAB, Santa Barbara County and Ventura County, are designated as unclassified and nonattainment, respectively. ARB staff recommend the Board redesignate San Luis Obispo County as attainment for the State PM2.5 standard.

In designating an area smaller than an air basin as attainment for PM2.5, the Board must find that air quality in the smaller area is distinctly different from the rest of the air basin. San Luis Obispo County is separated from the other two counties in the SCCAB by mountains, and its air quality is more closely linked with that of the San Francisco Bay Area and San Joaquin Valley than that of Santa Barbara County or Ventura County (ARB, December 2003). Furthermore, because of the differences in topography and air quality, the three counties in the SCCAB are treated as separate planning areas. These factors indicate that the PM2.5 air quality in San Luis Obispo County is distinctly different from that in the rest of the SCCAB. Data from monitoring sites at Atascadero and San Luis Obispo-March St (SLO-March) have been consistently low with Atascadero showing a three-year maximum of 8 $\mu g/m^3$ and SLO-March a two-year maximum of almost half the standard at 7 $\mu g/m^3$.

Based on the available PM2.5 data and the conservative estimates for the years with missing data, ARB staff conclude that the State PM2.5 standard is not violated in San Luis Obispo County of the SCCAB, and should be designated as a separate attainment area.

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CHAPTER IV

ALTERNATIVES TO THE PROPOSED AMENDMENTS

State law (H&SC section 39607(e)) requires the Board to establish criteria for designating areas as attainment, nonattainment, or unclassified for the State standards. State law (H&SC section 39608(c)) further requires the Board to use the designation criteria in an annual review of the area designations.

ARB staff's proposed amendments to the area designations are described in Chapter III. The proposed area designations reflect the application of the designation criteria set forth in CCR, title 17, sections 70300 through 70306 and Appendices 1 through 4, thereof. Each proposed area designation is accompanied by a discussion of its basis and justification. ARB staff have considered the potential alternatives to the proposed amendments (namely, the no action alternative). However, based on the available data, ARB staff find the proposed amendments are more appropriate than the no action alternative because the no action alternative would not be consistent with State law. In addition, the no action alternative would not inform the public about the healthfulness of air quality based on the most recent data.

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CHAPTER V

IMPACTS OF THE PROPOSED AMENDMENTS

A. ECONOMIC IMPACTS

ARB staff do not expect the proposed amendments to have any adverse impacts on California employment, business status, or competitiveness.

1. Legal Requirement

The Government Code requires State agencies proposing to adopt or amend any administrative regulation to assess the potential for adverse economic impact on California business enterprises and individuals. The assessment shall include consideration of the impact of the proposed regulatory amendments on California jobs, business expansion, elimination, or creation, and the ability of California businesses to compete in other states.

State agencies are also required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. This estimate is to include non-discretionary costs or savings to local agencies and the costs or savings in federal funding to the State.

2. Potential Impact on Businesses, Business Competitiveness, Employment, and Business Creation, Elimination, or Expansion

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 amendments are presented below.

The proposed amendments to the area designation regulations do not contain any requirements for action. The area designations are simply labels that describe the healthfulness of the air quality in each area, although subsequent requirements for action may result after additional steps, such as plan preparation and approval, are taken. Because the area designation regulations by themselves contain no requirements for action, they have no direct economic impact, and the following general determinations are appropriate.

In developing this regulatory proposal, 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 also 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.

The Executive Officer has also determined, pursuant to title 1, CCR, section 4, that the proposed regulatory action will not affect small businesses because the proposed regulatory action does not contain any requirements for action.

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 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.

3. Potential Cost to Local and State Agencies

Similar to the previous discussion, the area designations do not contain any requirements for action, and these regulations have no direct economic impact. Therefore, 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 under Part 7 (commencing with section 17500), Division 4, Title 2 of the Government Code, or other nondiscretionary savings to State or local agencies.

Before taking final action on the proposed amendments to the regulations, the Board must determine that no alternative considered by 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.

CHAPTER VI

ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL JUSTICE

A. INTRODUCTION

The intent of the proposed regulatory action is to identify areas with unhealthy ambient air quality. Adopting the proposed amendments to the area designations will not result in any direct impact on public health or the environment because the regulations do not contain any requirements for action. However, because State law specifies certain requirements based on an area's designation status, there may be indirect benefits, based on the area designations.

B. AIR QUALITY AND ENVIRONMENTAL BENEFITS

The area designations do not contain any requirements for action, and therefore, they will not result in any air quality or environmental benefits. However, the area designations do label areas with respect to the healthfulness of their air quality. Based on these labels, certain planning requirements may come into play, thereby providing some indirect benefits to air quality and the environment.

The proposed amendments to the area designations would change the State ozone designations for fifteen areas. Under State law, there are specific planning requirements for areas designated as nonattainment or nonattainment-transitional for ozone and CO. Furthermore, areas designated as attainment are required to adopt and implement rules and regulations necessary to maintain attainment status. The goal of these planning requirements is to bring the area into attainment as expeditiously as practicable. Therefore, these requirements will result in air quality and environmental benefits.

ARB staff are also proposing one change each to the State CO, PM10, and PM2.5 designations. These changes would designate areas as attainment. Areas designated as attainment for any pollutant are required to adopt and implement the rules and regulations necessary to maintain attainment status. These requirements will result in air quality and environmental benefits.

C. ENVIRONMENTAL JUSTICE

The Board is committed to evaluating community impacts of proposed regulations, including environmental justice concerns. Because some communities experience higher exposures to air pollutants, it is a priority of the Board to ensure that full protection is afforded to all Californians. The proposed amendments to the area

designations do not contain any requirements for action. However, the area designations are designed to identify areas with unhealthful air quality, based on the most recently available data.

Based on an area's designation category, there may be specific planning requirements for improving the level of air quality. These requirements will result in reduced emissions for all nonattainment communities throughout the State. Furthermore, although State law does not impose any specific planning requirements upon districts with areas designated as attainment or unclassified, State law does require districts and the Board to make a coordinated effort to protect and enhance the ambient air quality (H&SC sections 39001 through 39003). As part of this effort, the districts must adopt rules and regulations sufficiently effective to achieve and maintain the State standards (H&SC sections 40001 and 41500). These requirements will result in improved air quality in communities throughout the State, with associated lower potential health risks.

ATTACHMENT A

AREA DESIGNATION CRITERIA

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AREA DESIGNATION CRITERIA

CALIFORNIA CODE OF REGULATIONS, TITLE 17, SECTIONS 70300 THROUGH 70306, AND APPENDICES 1 THROUGH 4, THEREOF

70300. General Statement of Purpose

The objective of these criteria is to guide the state board in making designations of areas as attainment, nonattainment, nonattainment-transitional, or unclassified for each of the pollutants for which state ambient air quality standards have been established in Section 70200.

NOTE: Authority Cited: sections 39600, 39601, 39607, 39608, and 40925.5, Health and Safety Code. Reference: sections 39607, 39608, and 40925.5, Health and Safety Code.

70301. Air Quality Data Used for Designations

(a) Except as otherwise provided in this article, designations shall be based on "data for record."

(1) Data for record are those data collected by or under the auspices of the state board or the districts for the purpose of measuring ambient air quality, and which the executive officer has determined comply with the siting and quality assurance procedures established in Part 58, Title 40, Code of Federal Regulations, as they existed on July 1, 1987, or other equivalent procedures.

(2) Any other data which are provided by a district or by any other person will be data for record if the executive officer determines within 90 days of submittal of complete supporting documentation that the data comply with the siting and quality assurance procedures established in Part 58, Title 40, Code of Federal Regulations, as they existed on July 1, 1987, or other equivalent procedures. If the executive officer finds there is good cause that 90 days is insufficient time to make a determination, he/she may after notification of the person requesting the data review extend the deadline for completion of the data review.

(b) Except as otherwise provided in this article, designations and reviews of designations will be based on data for record for the three calendar years prior to the year in which the designation is made or the annual review of the designation is conducted.

(c) Data as described in section 70301(a)(1) and (2) become data for record upon completion of the executive officer's review.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 39608, Health and Safety Code. Reference: sections 39607 and 39608, Health and Safety Code.

70302. Geographic Extent of Designations

(a) An air basin will be the area designated for ozone, nitrogen dioxide, suspended particulate matter (PM10), fine suspended particulate matter (PM2.5), sulfates, and visibility reducing particles. Provided, however, if the state board finds (based on air quality data, meteorology, topography, or the distribution of population and emissions) that there are areas within an air basin with distinctly different air quality deriving from sources and conditions not affecting the entire air basin, the state board may designate an area smaller than an air basin using political boundary lines to the extent practicable. In designating an area smaller than an air basin as nonattainment, the state board will include within the area those sources whose emissions contribute to a violation of a state standard for that pollutant. Contiguous areas which would have the same designation within an air basin will be one designated area.

(b) A county or the portion of a county which is located within an air basin will be the area designated for carbon monoxide, sulfur dioxide, lead (particulate), and hydrogen sulfide. Provided, however, if the state board finds (based on air quality data, meteorology, topography, or the distribution of population and emissions) that there are areas within the county with distinctly different air quality, it may designate a smaller area. In designating an area smaller than a county as nonattainment, the state board will include within the area those sources whose emissions contribute to a violation of a state standard for that pollutant.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 39608, Health and Safety Code. Reference: sections 39607 and 38608, Health and Safety Code.

70303. Criteria for Designating an Area as Nonattainment

(a) The state board will designate an area as nonattainment for a pollutant if:

(1) Data for record show at least one violation of a state standard for that pollutant in the area, and the measurement of the violation meets the representativeness criteria set forth in "Criteria for Determining Data Representativeness" contained in Appendix 1 to this article; or

(2) Limited or no air quality data were collected in the area, but the state board finds, based on meteorology, topography, and air quality data for an adjacent nonattainment area, that there has been at least one violation of a state standard for that pollutant in the area being designated.

(b) An area will not be designated as nonattainment if the only recorded exceedance(s) of that state standard were based solely on data for record determined to be affected by a highly irregular or infrequent event. Data affected by a highly irregular or infrequent event will be identified as such by the executive officer in accordance with the "Air Resources Board Procedure for Reviewing Air Quality Data Possibly Affected by a Highly Irregular or Infrequent Event," set forth in Appendix 2 to this article.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 39608, Health and Safety Code. Reference: sections 39607, and 39608, Health and Safety Code.

70303.1. Criteria for Designating an Area as Nonattainment-Transitional for Pollutants Other than Ozone

(a) Nonattainment-transitional is a subcategory of the nonattainment designation. The state board will, if requested by a district no later than May 1 of each year pursuant to section 70306, identify that portion of a designated area within the district as nonattainment-transitional for a pollutant other than ozone with a state standard averaging time less than or equal to 24 hours and for which samples are routinely collected every day if it finds that:

(1) Data for record for the previous calendar year are consistent with the criteria established in section 70304(a)(2) and show two or fewer days at each site in the area with violations of a state standard for that pollutant (not including exceedances found to be affected by a highly irregular or infrequent event under the procedure set forth in Appendix 2 to this article);

(2) Evaluation of multi-year air quality, meteorological and emission data indicates that ambient air quality either has stabilized or is improving and that every site in the area is expected to reach attainment within three years; and

(3) The geographic extent of the area is consistent with the criteria established in section 70302.

(b) An area designated as nonattainment-transitional for a pollutant is close to attaining the state standard(s) for that pollutant. The nonattainment-transitional designation provides an opportunity for a district to review and potentially to modify its attainment plan. Any modification to an attainment plan must be consistent with state and federal regulations and statutes.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 39608, Health and Safety Code. Reference: sections 39607 and 39608, Health and Safety Code.

70303.5. Requirements for Ozone Nonattainment-Transitional

(a) If an area within an air basin is designated as nonattainment for ozone, that area is designated as nonattainment-transitional for ozone if the following conditions are met:

(1) The area is an entire district within an air basin, or the area is the entire portion of a district within an air basin consistent with the criteria established in section 70302(a);

(2) Data for record consistent with the criteria established in section 70304(a)(2) are used to determine the number of exceedances for the previous calendar year at each monitoring location in the area;

(3) All data collected during the previous calendar year are considered in the evaluation, including data possibly affected by a highly irregular or infrequent event under the procedure set forth in Appendix 2 to this article;

(4) Each day with concentration(s) that exceed the state ozone standard is counted as one exceedance day; and

(5) No monitoring location in the area has more than three exceedance days during the previous calendar year.

(b) If an area qualifies for designation as nonattainment-transitional for ozone for the previous calendar year under section 70303.5(a), and the executive officer has determined that data for the current calendar year indicate more than three exceedance days at any one monitoring location, that area is designated as nonattainment.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 40925.5, Health and Safety Code. Reference: sections 39607 and 40925.5, Health and Safety Code.

70304. Criteria for Designating an Area as Attainment

(a) The state board will designate an area as attainment for a pollutant if:

(1) Data for record show that no state standard for that pollutant was violated at any site in the area; and

(2) Data for record meet representativeness and completeness criteria for a location at which the pollutant concentrations are expected to be high based on the spatial distribution of emission sources in the area and the relationship of emissions to air quality. Data representativeness criteria are set forth in "Criteria for Determining Data Representativeness" contained in Appendix 1 to this article. Data completeness criteria are set forth in "Criteria for Determining Data Completeness" contained in Appendix 3 to this article.

(b) Where there are limited or no air quality data for an area, the state board will designate the area as attainment for a pollutant if it finds that no state standard for that pollutant has been violated in that area based on:

(1) Air quality data collected in the area during the most recent period since 1980 which meet the conditions in (a) above;

(2) Emissions of that pollutant or its precursors in the area have not increased since that period to a level at which the state standard might be exceeded; and

(3) Air quality data collected in the area since the time period in (1) above do not show a violation of the state standard.

(c) Where an area has limited or no air quality data for nitrogen dioxide, sulfur dioxide, sulfates, and lead (particulate),-the state board shall designate that area attainment for a pollutant if it finds that no state standard for that pollutant has been violated in that area based on the "Screening Procedure for Determining Attainment Designations for Areas with Incomplete Air Quality Data" set forth in Appendix 4 to this article.

(d) A nonattainment area will not be redesignated as attainment for a pollutant if:

(1) Data for record for the monitoring site showing the greatest violation of a state standard for that pollutant no longer are available; and

(2) No other site has been identified as equivalent by the executive officer.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 39608, Health and Safety Code. Reference: sections 39607 and 39608, Health and Safety Code.

70305. Criteria for Designating an Area as Unclassified

The state board will designate an area as unclassified for a pollutant if it finds that, except as otherwise provided in this article, the data do not support a designation of attainment or nonattainment.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 39608, Health and Safety Code. Reference: sections 39607 and 39608, Health and Safety Code.

70306. Annual Review of Designations

(a) The executive officer will conduct annual reviews of all designations and will propose revisions to the designations as necessary to the state board. The executive officer will complete the annual reviews by November 15.

(b) Any request for a change in a designation and any submittal of information for purposes of the executive officer's consideration in the annual review of a designation shall be provided in writing to the executive officer no later than May 1 of each year.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 39608, Health and Safety Code. Reference: sections 39607 and 39608, Health and Safety Code.

APPENDIX 1

CRITERIA FOR DETERMINING DATA REPRESENTATIVENESS

This Appendix describes the criteria to be used in determining the representativeness of individual air quality measurements and statistics for the purpose of designating areas as described in this article. Data representativeness, as that term is used herein, relates to the determination of whether the amount of data reflected in an individual air quality measurement or statistic is sufficient to characterize reliably air quality during the respective averaging time of a state standard. The criteria for determining data representativeness are summarized in the accompanying table and discussed further, below.

Air quality measurements and statistics are usually computed from short term observed values. If all the short term values for the statistical time period are available, the calculated statistic is representative. However, because all the short term values for a given period often are not available, a minimum number of observations are needed to provide reasonable assurance that the calculated measurement or statistic is a reliable estimate for the averaging time specified in the state standard.

In general, air quality measurements and statistics are considered representative if a minimum of 75 percent of all the potential short term values are included and are distributed throughout the entire statistical time period. This 75 percent criteria must be met from the averaging time of the initial measurement, up to and including, the final averaging time reflected by the air quality measurement or statistic. For example, a maximum daily statistic must meet the representativeness criteria specified for a "Day." Because a daily statistic reflects a single day, it does not need to meet the representativeness criteria for any other level (Month, Quarter, or Year). In evaluating data representativeness, all measurements are considered, including those identified as affected by a highly irregular or infrequent event under the "Air Resources Board Procedure for Reviewing Air Quality Data Possibly Affected by a Highly Irregular or Infrequent Event," set forth in Appendix 2 to this article.

Individual air quality measurements and statistics used for designating an area as attainment, nonattainment-transitional, or nonattainment must be representative. Furthermore, to ensure that the the group of air quality measurements or statistics used for designating an area as attainment or nonattainment-transitional reflect the time of day and the season of expected high concentrations, these data must also be complete under the "Criteria for Determining Data Completeness" set forth in Appendix 3 to this article. In contrast, the air quality measurements or statistics used for designating an area as nonattainment are not required to be complete.

CRITERIA FOR REPRESENTATIVENESS OF AIR QUALITY MEASUREMENTS AND STATISTICS

Representative Calendar Statistic	Sampling Time Period	Basis of Statistic or Requirement	Number of Representative Periods Required
Year	Any		4 representative calendar quarters
Quarter	24-hour	Based on a daily sample	3 representative months
	<24-hours	Based on a daily statistic; or	69 or more representative calendar days
		Based on hourly samples	1,643 or more hours
Month	24-hour	Based on infrequent sampling (1-in-6 day, 1-in-3 day, 1-in-2 day)	75% of all potential samples
		Based on a daily statistic; or	23 or more representative calendar days
		Based on all hourly samples; or	548 or more hours
	<24-hours	Based on all 2-hour samples; or	274 or more 2-hour samples
		Based on all 3-hour samples	183 or more 3-hour samples
	1-hour		6 or more hours in each 1/3 day (hours 0 thru 7, 8 thru 15, 16 thru 23), & missing no more than 2 consecutive hourly samples
Day	2-hour	Based on all 2-hour samples	9 or more samples
	3-hour	Based on all 3-hour samples	6 or more samples
	24-hour	Based on daily sample	22 but not more than 26 hours of sampling

Mean of N Hour Period	N	Number of Samples Needed
	24	18 or more hourly samples
	8	6 or more hourly samples
	6	5 or more hourly samples
	4	3 hourly samples
	3	3 hourly samples
	2	2 hourly samples
	1	30 minutes or more of sampling

APPENDIX 2

AIR RESOURCES BOARD PROCEDURE FOR REVIEWING AIR QUALITY DATA POSSIBLY AFFECTED BY A HIGHLY IRREGULAR OR INFREQUENT EVENT

This Appendix describes the procedures that the Air Resources Board will use for reviewing air quality data possibly affected by a highly irregular or infrequent event with regard to the state ambient air quality standards. All decisions regarding the identification of data as being affected by a highly irregular or infrequent event will be made by the executive officer.

The executive officer will review air quality data for possible identification as affected by a highly irregular or infrequent event if the data are the only exceedances of a state ambient air quality standard in the area or if such identification would otherwise affect the designation of the area.

Three types of highly irregular or infrequent events may be identified:

1. Extreme Concentration Event.
2. Exceptional Event.
3. Unusual Concentration Event.

Extreme Concentration Events

An extreme concentration event is an event beyond reasonable regulatory control which causes an exceedance of a state standard. An extreme concentration event is based on a statistical procedure and may not always be linked to a specific identifiable cause. The causes of an extreme concentration event include but are not limited to unusual meteorology.

The steps for identifying an extreme concentration event are:

1. A district (or the executive officer) identifies questionable data.

2. In evaluating a possible extreme concentration event, the executive officer will use the data for the site at which the event is suspected to determine a limit for concentrations expected to recur no more frequently than once in one year. The limit will be determined using the "exponential tail method" described in Procedure for Computing the Values Used in Identifying Extreme Concentration Events (August 1998), which is incorporated by reference herein.

Using conventional rounding procedures, the limit will be consistent with the level of precision in which the state standard is expressed. If the possible extreme concentration exceeds the concentration expected to recur no more frequently than once in one year, the executive officer will consult with the district in identifying the data as affected by an extreme concentration event.

3. When an extreme concentration event is identified, the executive officer will review other information, including but not limited to meteorological data, to determine whether air quality data for other sites in the area were affected by the extreme concentration event.

Exceptional Events

An exceptional event is an event beyond reasonable regulatory control which causes an exceedance of a state standard. An exceptional event must be linked to a specific cause such as an act of nature or unusual human activity. As guidance to the states for determining exceptional events, the federal Environmental Protection Agency (EPA) has published Guideline on the Identification and Use of Air Quality Data Affected by Exceptional Events, (EPA-450/4-86-007), July 1986 (the EPA Guideline). The EPA Guideline provides overall criteria for determining whether an event is exceptional with regard to the national standards. The executive officer will use the EPA Guideline as a general basis for reviewing ambient data, but will not be bound by the specific definitions in the EPA Guideline for the various types of exceptional events because those definitions are made on a national basis. In addition, since what may be exceptional in one part of the state may be common in another, each possible event will be evaluated on a case-by-case basis.

The steps for identifying an exceptional event are:

1. A district (or the executive officer) identifies questionable data.

2. If a known exceptional event has occurred, the district gathers relevant data to document the occurrence.

3. If an exceptional event is only suspected, the district investigates available data for the possible event.

4. The district submits to the executive officer a request for identifying the data as affected by an exceptional event and also provides supporting documentation.

5. If the executive officer concurs with the district, he/she will identify the data as affected by an exceptional event.
6. If the district's request for identifying data as affected by an exceptional event cannot be supported, the district will be notified of the reasons. The executive officer will consider any additional data to support the request, but in the absence of any new evidence, will disapprove the request.

Unusual Concentration Events

An unusual concentration event is an event which causes an anomalous exceedance of a state standard and which does not qualify as an extreme concentration event or an exceptional event. An exceedance affected by an unusual concentration event may be identified only for an area designated as attainment or unclassified at the time of the exceedance.

The steps for identifying an unusual concentration event are:

1. A district (or the executive officer) identifies a questionable exceedance(s).

2. If the exceedance(s) has not been identified as having been affected by an extreme concentration event or an exceptional event, and if the area was designated as attainment or unclassified at the time of the exceedance(s), the executive officer will review the exceedance(s) to determine whether it was affected by an unusual concentration event.

3. In evaluating a possible unusual concentration event, the executive officer will consider all relevant information, including but not limited to the amount and characteristics of air quality data, emission data, meteorological data, potential public health and welfare impacts, and any applicable state, district, and federal rules and regulations. To identify the exceedance(s) as affected by an unusual concentration event, the executive officer must find, based on the relevant information, that the impact of the exceedance(s) is limited to the local area, the exceedance(s) is not expected to recur, and that the data do not support a nonattainment designation.

4. If the exceedance(s) qualifies as possibly affected by an unusual concentration event, the executive officer will consult with the district in identifying the exceedance(s) as affected by an unusual concentration event.

5. An area may retain its attainment or unclassified designation based on the identification and exclusion of an exceedance(s) affected by an unusual concentration event for no more than three consecutive years. If the executive officer identifies an exceedance(s) affected by an unusual concentration event in the area in the fourth consecutive year, the area will be redesignated as nonattainment.

NOTE: Authority Cited: sections 39600, 39601, 39607, and 39608, Health and Safety Code. Reference: sections 39607 and 39608, Health and Safety Code.

APPENDIX 3

CRITERIA FOR DETERMINING DATA COMPLETENESS

This Appendix describes the criteria to be used in determining data completeness for the purpose of designating areas as described in this article. These Criteria for Determining Data Completeness (Completeness Criteria) apply only to air quality data used in designating an area as attainment or nonattainment-transitional. Air quality data used in designating an area as nonattainment do not need to be complete. The purpose of these Completeness Criteria is to specify the minimum amount of data deemed necessary to ensure that sampling occurred at times when a violation is most likely to occur.

After a set or group of air quality measurements or statistics are deemed representative under the Criteria for Determining Data Representativeness set forth in Appendix 1 to this article, they are then evaluated under these Completeness Criteria to ensure that the group of representative measurements or statistics reflect the time of day and the season of the year during which high concentrations are likely to occur.

Complete Data

Data for a site will be complete if there are representative data (as determined in accordance with the Representativeness Criteria in Appendix 1 to this article) during the required hours (see below) of the day during the required months (see below) for the required years (see below).

Required Hours

The hours of potentially high concentration must be included. Unless a detailed evaluation determines different hours to be appropriate for a specific site, these hours are:

Pollutant	Hours (PST)
Ozone	9 am - 5 pm
Carbon Monoxide	3 pm - 9 am (next day)
Nitrogen Dioxide	8 am - 8 pm
Visibility Reducing Particles	10 am - 6 pm
Other Pollutants	Throughout day

Required Months

The months of potentially high concentrations must be included. Unless a detailed evaluation determines different months to be appropriate for a specific site, these months are:

Pollutant	Months
Ozone	July - September
Carbon Monoxide	January, November - December
Nitrogen Dioxide	October - December
Sulfur Dioxide	September - December
Sulfates	January, June - December
Lead (Particulate)	January, November - December
Other Pollutants	January - December

Required Years *for an Attainment Designation*

The number of years to be included for an attainment designation is:

a) Three; or

b) Two, if during these years the maximum pollutant concentration (not including data found to be affected by a highly irregular or infrequent event under the procedure set forth in Appendix 2 to this article) is less than three-fourths the applicable state ambient air quality standard; or

c) One, if during this year the maximum pollutant concentration (not including data found to be affected by a highly irregular or infrequent event under the procedure set forth in Appendix 2 to this article) is less than one-half the applicable state ambient air quality standard.

APPENDIX 4

SCREENING PROCEDURE FOR DETERMINING ATTAINMENT DESIGNATIONS FOR AREAS WITH INCOMPLETE AIR QUALITY DATA

This Appendix describes the screening procedure that will serve as the basis for making a pollutant-specific finding under section 70304(c) that the state ambient air quality standard is being attained for areas with no or an incomplete air quality data record. The procedure is applicable only for nitrogen dioxide, sulfur dioxide, sulfates, and lead (particulate). For those areas with some air quality data for the prior three years, the screening procedure will be applied for a pollutant only if the maximum concentrations of that pollutant in the area did not exceed 75 percent of the state standard(s).

Pollutant		Screening Parameters	Screening Values
Nitrogen Dioxide	a)	Basin Population	1,000,000 people
	b)	Total Annual NOx Emissions in Air Basin	40,000 tons/yr
	c)	Total Annual Point Source NOx Emissions in County	2,100 tons/yr
Sulfur Dioxide	a)	Total Annual Point Source SOx emissions in County	1,700 tons/yr
	b)	Maximum Annual SOx Emissions from Single Facility in County	900 tons/yr
Sulfates	a)	Total Annual SOx Emissions in Air Basin	19,000 tons/yr
	b)	Total Annual Point Source SOx Emissions in County	1,700 tons/yr
	c)	Maximum Annual SOx Emissions from Single Facility in County	900 tons/yr
Lead	a)	County Population	600,000 people
	b)	Maximum Annual Lead Emissions from Single Facility in County	0.5 tons/yr

For an area to which these values are applied, the local values of the applicable screening parameters will be compared to the respective screening values. The area will be presumed to be attainment if none of the applicable screening parameters for a pollutant exceed the associated screening values.

ATTACHMENT B

PROPOSED AMENDMENTS TO THE AREA DESIGNATIONS

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ATTACHMENT B

PROPOSED AMENDMENTS TO THE AREA DESIGNATIONS

CALIFORNIA CODE OF REGULATIONS, TITLE 17, SECTIONS 60201, 60202, 60205, AND 60210

(Additions are shown as *underline italics* and deletions as ~~strikeout~~)

60201. Table of Area Designations for Ozone

Area	Designation
North Coast Air Basin	~~Attainment~~
Sonoma County	*Nonattainment*
Remainder of Air Basin	*Attainment*
San Francisco Bay Area Air Basin	Nonattainment
North Central Coast Air Basin	Nonattainment~~-Transitional~~
South Central Coast Air Basin	*Nonattainment*
~~San Luis Obispo County~~	~~Attainment~~
~~Remainder of Air Basin~~	~~Nonattainment~~
South Coast Air Basin	Nonattainment
San Diego Air Basin	Nonattainment
Northeast Plateau Air Basin	~~Attainment~~
Siskiyou County	*Nonattainment*
Remainder of Air Basin	*Unclassified*
Sacramento Valley Air Basin	
~~Butte County~~	~~Nonattainment-Transitional~~
Colusa County	Nonattainment-Transitional
Glenn County	Nonattainment-Transitional
~~Shasta County~~	~~Nonattainment-Transitional~~
~~Solano County~~	~~Nonattainment-Transitional~~
~~Sutter County~~	~~Nonattainment-Transitional~~
~~Tehama County~~	~~Nonattainment-Transitional~~
~~Yolo County~~	~~Nonattainment-Transitional~~
~~Yuba County~~	~~Nonattainment-Transitional~~
Remainder of Air Basin	Nonattainment
San Joaquin Valley Air Basin	Nonattainment

60201. Table of Area Designations for Ozone (continued)

Area	Designation
Great Basin Valleys Air Basin	
Alpine County	Unclassified
Inyo County	~~Unclassified~~ *Nonattainment*
Mono County	Nonattainment
Mojave Desert Air Basin	Nonattainment
Salton Sea Air Basin	Nonattainment
Mountain Counties Air Basin	
Amador, Calaveras, El Dorado, Nevada, Placer, Mariposa, and Tuolumne Counties	Nonattainment
Plumas and Sierra Counties	Unclassified
Lake County Air Basin	Attainment
Lake Tahoe Air Basin	~~Attainment~~ *Unclassified*

NOTE: Authority cited: sections 39600, 39601, and 39608, Health and Safety Code. Reference: sections 39608 and 40925.5, Health and Safety Code.

60202. Table of Area Designations for Carbon Monoxide

Area	Designation
North Coast Air Basin	
Del Norte County	Unclassified
Humboldt County	Attainment
Mendocino County	Attainment
Sonoma County	Unclassified
Trinity County	Unclassified
San Francisco Bay Area Air Basin	
Alameda County	Attainment
Contra Costa County	Attainment
Marin County	Attainment
Napa County	Attainment
San Francisco County	Attainment
San Mateo County	Attainment
Santa Clara County	Attainment
Solano County	Attainment
Sonoma County	Attainment
North Central Coast Air Basin	
Monterey County	Attainment
San Benito County	Unclassified
Santa Cruz County	Unclassified
South Central Coast Air Basin	
San Luis Obispo County	Attainment
Santa Barbara County	Attainment
Ventura County	Attainment
South Coast Air Basin	
Los Angeles County	Attainment
Orange County	Attainment
Riverside County	Attainment
San Bernardino County	Attainment
San Diego Air Basin	Attainment
Northeast Plateau Air Basin	
Lassen County	Unclassified
Modoc County	Unclassified
Siskiyou County	Unclassified

60202. Table of Area Designations for Carbon Monoxide (continued)

Area	Designation
Sacramento Valley Air Basin	
Butte County	Attainment
Colusa County	Unclassified
Glenn County	Unclassified
Placer County	Attainment
Sacramento County	Attainment
Shasta County	Unclassified
Solano County	Attainment
Sutter County	Attainment
Tehama County	Unclassified
Yolo County	Attainment
Yuba County	Unclassified
San Joaquin Valley Air Basin	
Fresno County	Attainment
Kern County	Attainment
Kings County	Unclassified
Madera County	Unclassified
Merced County	Unclassified
San Joaquin County	Attainment
Stanislaus County	Attainment
Tulare County	Attainment
Great Basin Valleys Air Basin	
Alpine County	Unclassified
Inyo County	Attainment
Mono County	Attainment

60202. Table of Area Designations for Carbon Monoxide (continued)

Area	Designation
Mojave Desert Air Basin	
Kern County	Unclassified
Los Angeles County	Attainment
Riverside County	Unclassified
San Bernardino County	Attainment
Salton Sea Air Basin	
Imperial County	*Attainment*
~~City of Calexico[1]~~	~~Nonattainment~~
~~Remainder of County~~	~~Unclassified~~
Riverside County	Attainment
Mountain Counties Air Basin	
Amador County	Unclassified
Calaveras County	Unclassified
El Dorado County	Unclassified
Mariposa County	Unclassified
Nevada County	Unclassified
Placer County	Unclassified
Plumas County	Attainment
Sierra County	Unclassified
Tuolumne County	Attainment
Lake County Air Basin	
Lake County	Attainment
Lake Tahoe Air Basin	Attainment

~~[1] section 60200(a).~~

NOTE: Authority cited: sections 39600, 39601, and 39608, Health and Safety Code. Reference: section 39608, Health and Safety Code.

60205. Table of Area Designations for Suspended Particulate Matter (PM_{10})

Area	Designation
North Coast Air Basin	~~Nonattainment~~
Sonoma County	*Attainment*
Remainder of Air Basin	*Nonattainment*
San Francisco Bay Area Air Basin	Nonattainment
North Central Coast Air Basin	Nonattainment
South Central Coast Air Basin	Nonattainment
South Coast Air Basin	Nonattainment
San Diego Air Basin	Nonattainment
Northeast Plateau Air Basin	
Siskiyou County	Attainment
Remainder of Air Basin	Nonattainment
Sacramento Valley Air Basin	Nonattainment
San Joaquin Valley Air Basin	Nonattainment
Great Basin Valleys Air Basin	Nonattainment
Mojave Desert Air Basin	Nonattainment
Salton Sea Air Basin	Nonattainment
Mountain Counties Air Basin	
El Dorado, Nevada, Placer Plumas, and Sierra Counties	Nonattainment
Amador County	Unclassified
Calaveras County	Nonattainment
Mariposa County Portion of Yosemite National Park	Nonattainment
Remainder of Mariposa and Tuolumne Counties	Unclassified
Lake County Air Basin	Attainment
Lake Tahoe Air Basin	Nonattainment

NOTE: Authority cited: sections 39600, 39601, and 39608, Health and Safety Code. Reference: section 39608, Health and Safety Code

60210. Table of Area Designations for Fine Particulate Matter ($PM_{2.5}$)

Area	Designation
North Coast Air Basin	Unclassified
San Francisco Bay Area Air Basin	Nonattainment
North Central Coast Air Basin	Attainment
South Central Coast Air Basin	
~~San Luis Obispo and Santa Barbara Counties~~	~~Unclassified~~
San Luis Obispo County	*Attainment*
Santa Barbara County	*Unclassified*
Ventura County	Nonattainment
South Coast Air Basin	Nonattainment
San Diego Air Basin	Nonattainment
Northeast Plateau Air Basin	Unclassified
Sacramento Valley Air Basin	
Butte County	Nonattainment
Placer and Sacramento Counties	Nonattainment
Remainder of Air Basin	Unclassified
San Joaquin Valley Air Basin	Nonattainment
Great Basin Valleys Air Basin	Unclassified
Mojave Desert Air Basin	
San Bernardino County	
County Portion of federal Southeast Desert Modified AQMA for Ozone[1]	Nonattainment
Remainder of San Bernardino County and Kern, Los Angeles, and Riverside Counties	Unclassified
Salton Sea Air Basin	
Imperial County	
City of Calexico[2]	Nonattainment
Remainder of Imperial County and Riverside County	Unclassified
Mountain Counties Air Basin	
Plumas County	
Portola Valley[3]	Nonattainment
Remainder of Plumas County and Amador, Calaveras, El Dorado, Mariposa, Nevada, Placer, Sierra, and Tuolumne Counties	Unclassified
Lake County Air Basin	Attainment
Lake Tahoe Air Basin	Attainment

[1] section 60200(b).
[2] section 60200(a).
[3] section 60200(c).

NOTE: Authority cited: sections 39600, 39601, and 39608, Health and Safety Code. Reference: section 39608, Health and Safety Code.

ATTACHMENT C

MAPS AND TABLES OF AREA DESIGNATIONS FOR STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

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ATTACHMENT C

MAPS AND TABLES OF AREA DESIGNATIONS FOR STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

This attachment fulfills the requirement of Health and Safety Code, section 40718 for the Board to publish maps that identify areas where one or more violations of any State ambient air quality standard (State standard) or national ambient air quality standard (national standard) have been measured. The national standards are those promulgated under section 109 of the federal Clean Air Act (42 U.S.C. 7409).

This attachment is divided into three parts. The first part comprises a table showing the levels, averaging times, and measurement methods for each of the State and national standards. This is followed by a section containing maps and tables showing the 2006 area designations for each pollutant for which there is a State standard in the California Code of Regulations, title 17, section 70200. The last section contains maps and tables showing the most current area designations for each pollutant for which there is a national standard.

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)*		0.08 ppm (157 µg/m^3)[8]		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		50 µg/m^3		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		65 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 µg/m^3)		—		
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	—	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	—	
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		—	—	—
Lead[9]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		**No Federal Standards**		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[9]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

*This concentration was approved by the Air Resources Board on April 28, 2005 and is expected to become effective in early 2006.

See footnotes on next page ...

California Air Resources Board (11/29/05)

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calender year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.

8. New federal 8-hour ozone and fine particulate matter standards were promulgated by U.S. EPA on July 18,1997. Contact U.S. EPA for further clarification and current federal policies.

9. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Area Designations for the State Ambient Air Quality Standards

The area designations for each pollutant with a State standard set forth in the California Code of Regulations, title 17, section 60200 are presented in the following maps and tables. Each area is identified as attainment, nonattainment, nonattainment-transitional, or unclassified for each pollutant, as shown below:

Attainment	**A**
Nonattainment	**N**
Nonattainment-Transitional	**NT**
Unclassified	**U**

Generally, the Board designates areas by air basin for pollutants with a regional impact and by county for pollutants with a more local impact. However, when there are areas within an air basin or county with distinctly different air quality deriving from sources and conditions not affecting the entire air basin or county, the Board may designate a smaller area. Generally, when boundaries of the designated area differ from the air basin or county boundaries, the description of the specific area is referenced at the bottom of the summary table.

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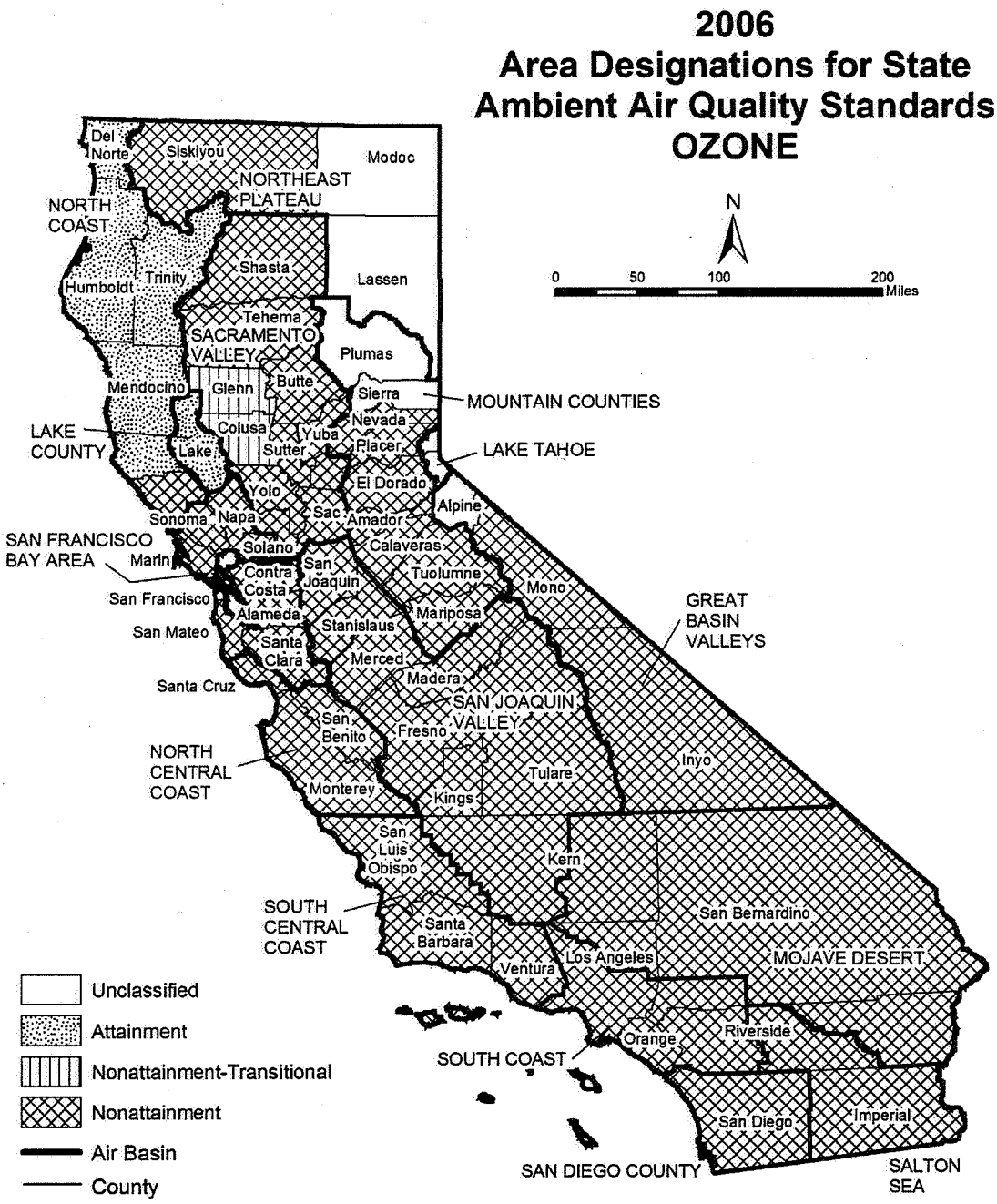
FIGURE 1



Source Date:
August 2006
Air Quality Data Branch, PTSD

August 24, 2006

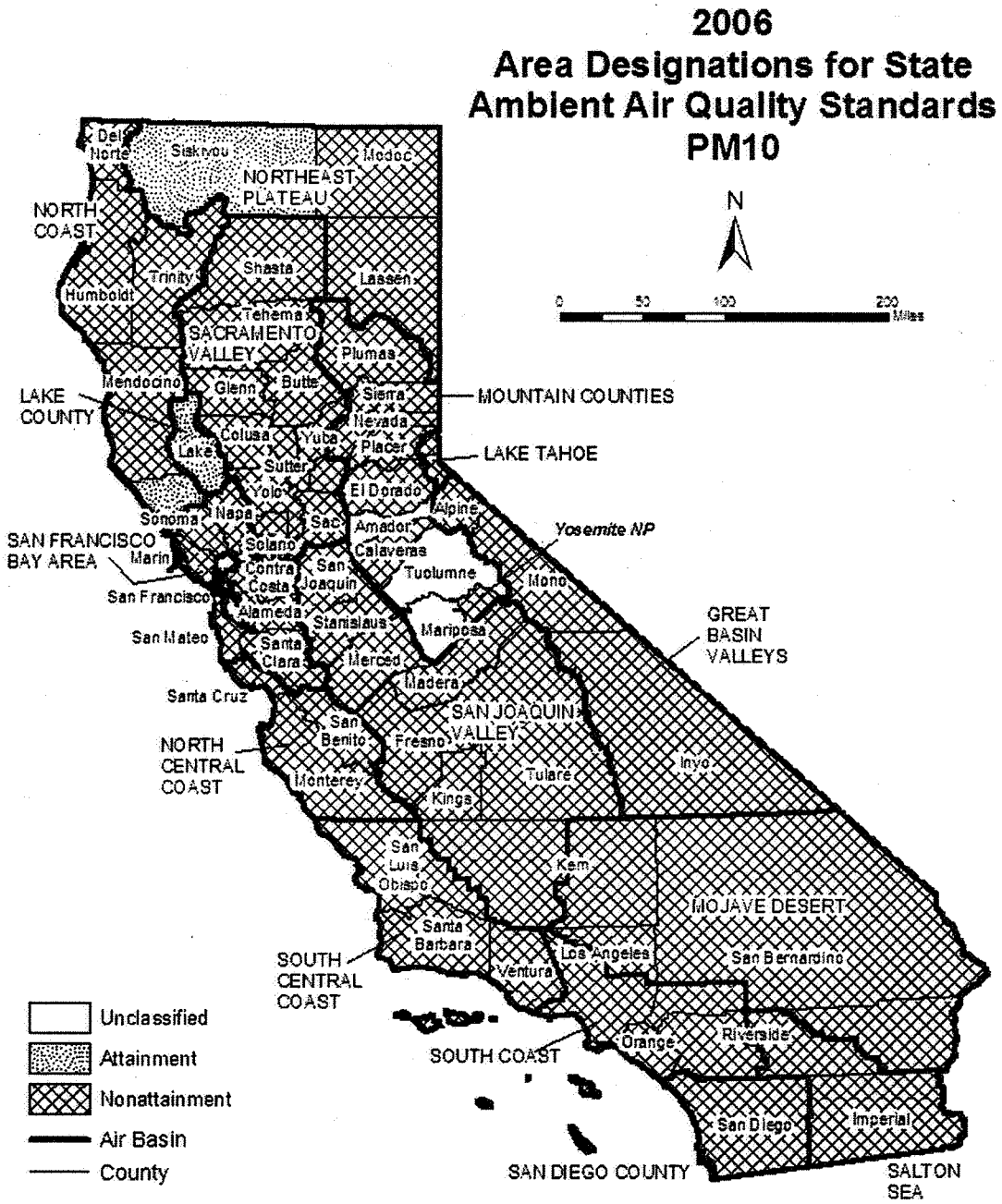
TABLE 1

California Ambient Air Quality Standards
Area Designations for Ozone

	N	NT	U	A		N	NT	U	A
NORTH COAST AIR BASIN					GREAT BASIN VALLEYS AIR BASIN				
Sonoma County (NCAB portion)	X				Alpine County			X	
Remainder of Air Basin				X	Inyo County	X			
SAN FRANCISCO BAY AREA AIR BASIN	X				Mono County	X			
NORTH CENTRAL COAST AIR BASIN	X				MOJAVE DESERT AIR BASIN	X			
SOUTH CENTRAL COAST AIR BASIN	X				SALTON SEA AIR BASIN	X			
SOUTH COAST AIR BASIN	X				MOUNTAIN COUNTIES AIR BASIN (MCAB)				
SAN DIEGO AIR BASIN	X				Amador County	X			
NORTHEAST PLATEAU AIR BASIN					Calaveras County	X			
Siskiyou County	X				El Dorado County (MCAB portion)	X			
Remainder of Air Basin			X		Mariposa County	X			
SACRAMENTO VALLEY AIR BASIN					Nevada County	X			
Glenn County		X			Placer County (MCAB portion)	X			
Colusa County		X			Plumas County			X	
Remainder of Air Basin (1)	X				Sierra County			X	
SAN JOAQUIN VALLEY AIR BASIN	X				Tuolumne County	X			
					LAKE COUNTY AIR BASIN				X
					LAKE TAHOE AIR BASIN			X	

(1) AB 3048 (Olberg) and AB 2525 (Miller) signed into law in 1996, made changes to Health and Safety Code, section 40925.5. One of the changes allows nonattainment districts to become nonattainment-transitional for ozone by operation of law. Similarly, nonattainment-transitional districts revert back to nonattainment by operation of law.

FIGURE 2



Source Date:
August 2006
Air Quality Data Branch, PTSD

August 24, 2006

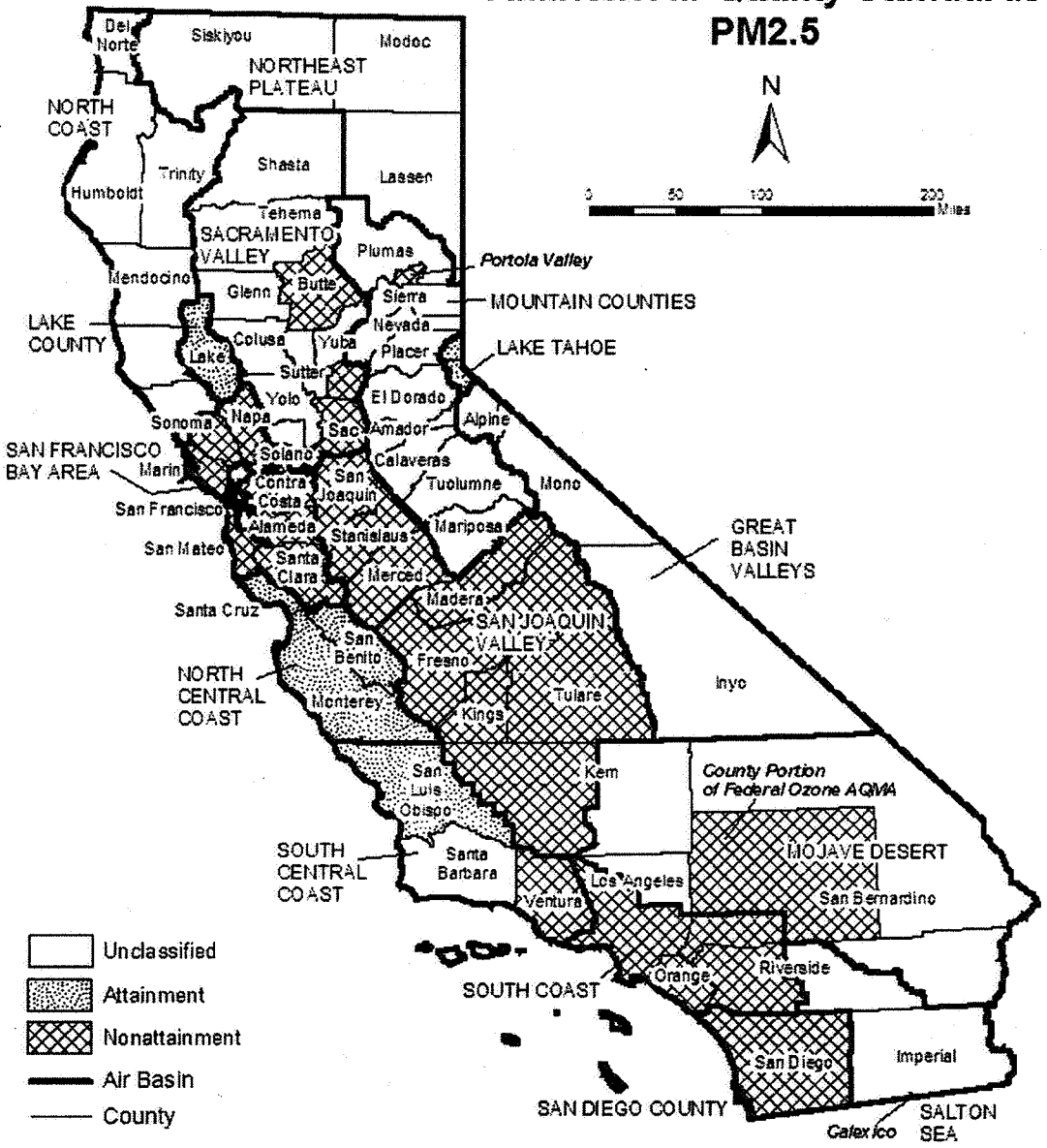
TABLE 2

California Ambient Air Quality Standards
Area Designations for Suspended Particulate Matter (PM10)

	N	U	A		N	U	A
NORTH COAST AIR BASIN (NCAB)				**SALTON SEA AIR BASIN**	X		
Sonoma County (NCAB portion)			X	**MOUNTAIN COUNTIES AIR BASIN (MCAB)**			
Remainder of Air Basin	X			Amador County		X	
SAN FRANCISCO BAY AREA AIR BASIN	X			Calaveras County	X		
NORTH CENTRAL COAST AIR BASIN	X			El Dorado County (MCAB portion)	X		
SOUTH CENTRAL COAST AIR BASIN	X			Mariposa County			
SOUTH COAST AIR BASIN	X			-Yosemite National Park	X		
SAN DIEGO AIR BASIN	X			-Remainder of County		X	
NORTHEAST PLATEAU AIR BASIN				Nevada County	X		
Siskiyou County			X	Placer County (MCAB portion)	X		
Remainder of Air Basin	X			Plumas County	X		
SACRAMENTO VALLEY AIR BASIN	X			Sierra County	X		
SAN JOAQUIN VALLEY AIR BASIN	X			Tuolumne County		X	
GREAT BASIN VALLEYS AIR BASIN	X			**LAKE COUNTY AIR BASIN**			X
MOJAVE DESERT AIR BASIN	X			**LAKE TAHOE AIR BASIN**	X		

FIGURE 3

2006
Area Designations for State Ambient Air Quality Standards
PM2.5



Source Date:
August 2006
Air Quality Data Branch, PTSD

August 24, 2006

TABLE 3

California Ambient Air Quality Standards
Area Designations for Fine Particulate Matter (PM2.5)

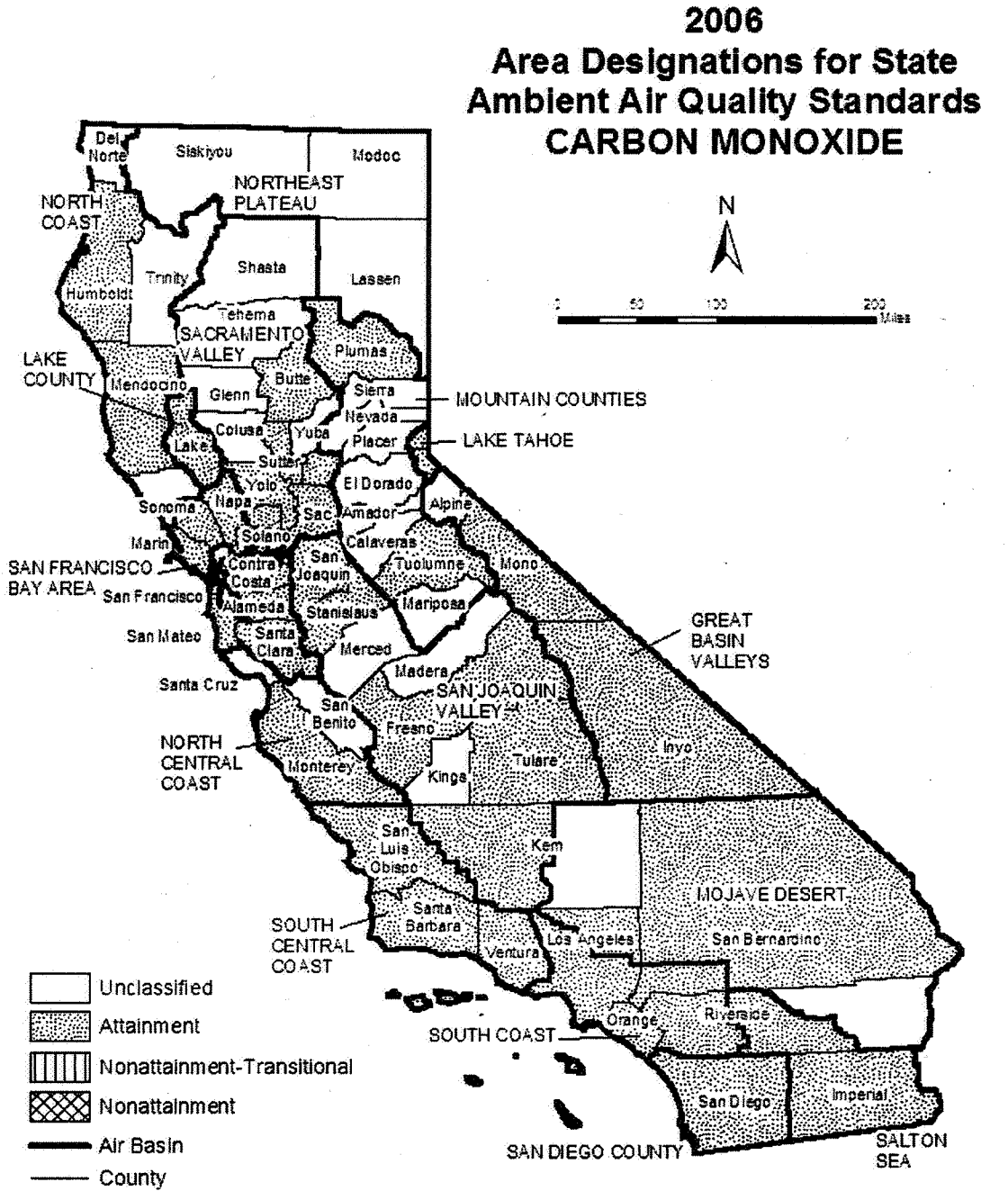
	N	U	A		N	U	A
NORTH COAST AIR BASIN		X		**GREAT BASIN VALLEYS AIR BASIN**		X	
SAN FRANCISCO BAY AREA AIR BASIN	X			**MOJAVE DESERT AIR BASIN**			
NORTH CENTRAL COAST AIR BASIN			X	San Bernardino County			
SOUTH CENTRAL COAST AIR BASIN				- County portion of federal Southeast Desert Modified AQMA for Ozone (1)	X		
San Luis Obispo County			X	Remainder of Air Basin		X	
Santa Barbara County		X		**SALTON SEA AIR BASIN**			
Ventura County	X			Imperial County			
SOUTH COAST AIR BASIN	X			- City of Calexico (2)	X		
SAN DIEGO AIR BASIN	X			Remainder of Air Basin		X	
NORTHEAST PLATEAU AIR BASIN		X		**MOUNTAIN COUNTIES AIR BASIN**			
SACRAMENTO VALLEY AIR BASIN (SVAB)				Plumas County			
Butte County	X			- Portola Valley (3)	X		
Sacramento County	X			Remainder of Air Basin		X	
Placer County (SVAB portion)	X			**LAKE COUNTY AIR BASIN**			X
Remainder of Air Basin		X		**LAKE TAHOE AIR BASIN**			X
SAN JOAQUIN VALLEY AIR BASIN	X						

(1) California Code of Regulations, title 17, section 60200(b).

(2) California Code of Regulations, title 17, section 60200(a).

(3) California Code of Regulations, title 17, section 60200(c).

FIGURE 4



Source Date:
August 2006
Air Quality Data Branch, PTSD

August 24, 2006

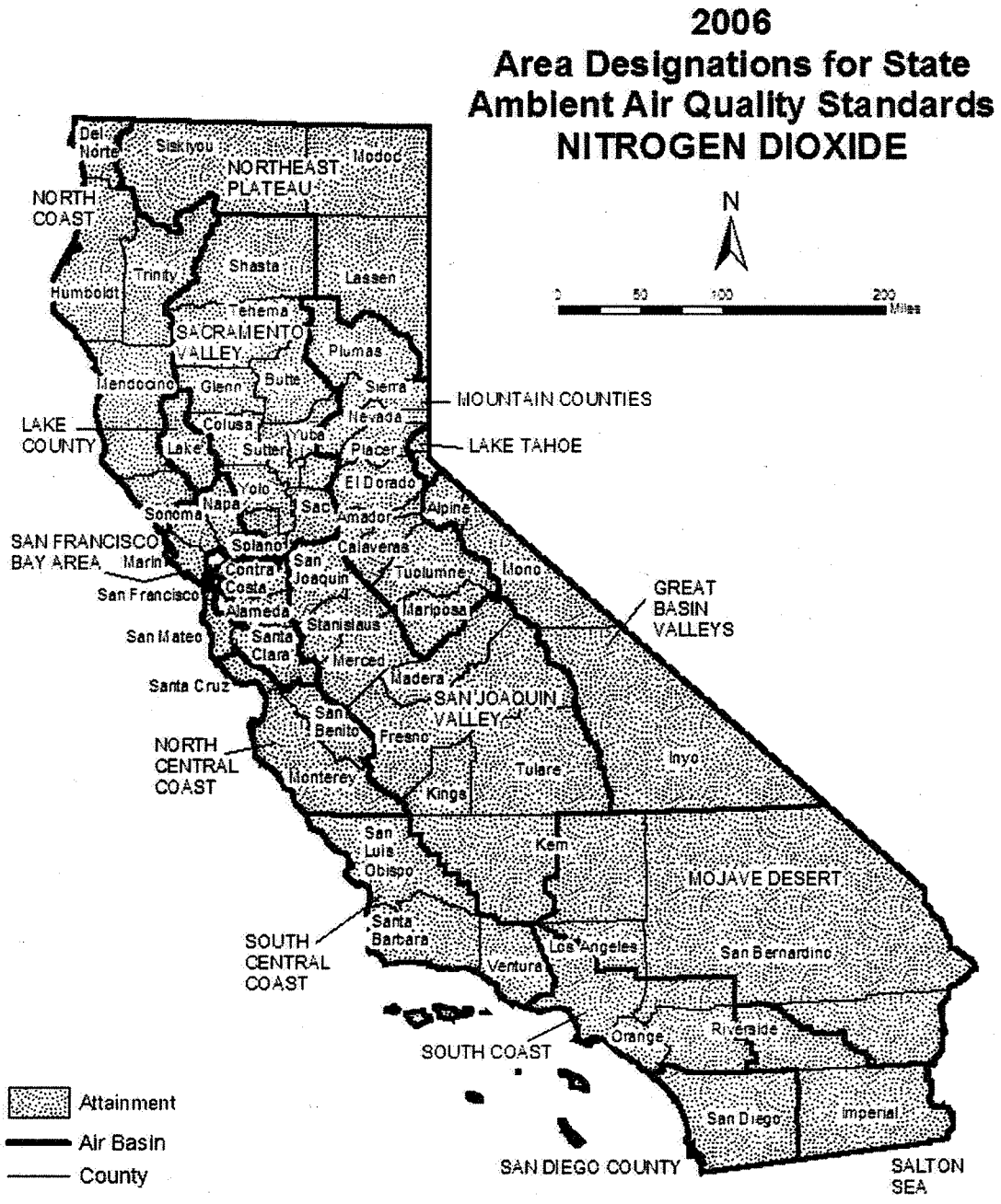
TABLE 4

California Ambient Air Quality Standards
Area Designations for Carbon Monoxide*

	N	NT	U	A		N	NT	U	A
NORTH COAST AIR BASIN (NCAB)					**SAN JOAQUIN VALLEY AIR BASIN (SJVAB)**				
Del Norte County			X		Fresno County				X
Humboldt County				X	Kern County (SJVAB portion)				X
Mendocino County				X	Kings County			X	
Sonoma County (NCAB portion)			X		Madera County			X	
Trinity County			X		Merced County			X	
SAN FRANCISCO BAY AREA AIR BASIN				X	San Joaquin County				X
NORTH CENTRAL COAST AIR BASIN					Stanislaus County				X
Monterey County				X	Tulare County				X
San Benito County			X		**GREAT BASIN VALLEYS AIR BASIN**				
Santa Cruz County			X		Alpine County			X	
SOUTH CENTRAL COAST AIR BASIN				X	Inyo County				X
SOUTH COAST AIR BASIN (SoCAB)					Mono County				X
Los Angeles County (SoCAB portion)				X	**MOJAVE DESERT AIR BASIN (MDAB)**				
Orange County				X	Kern County (MDAB portion)			X	
Riverside County (SoCAB portion)				X	Los Angeles County (MDAB portion)				X
San Bernardino County (SoCAB portion)				X	Riverside County (MDAB portion)			X	
SAN DIEGO AIR BASIN				X	San Bernardino County (MDAB portion)				X
NORTHEAST PLATEAU AIR BASIN			X		**SALTON SEA AIR BASIN (SSAB)**				
SACRAMENTO VALLEY AIR BASIN (SVAB)					Imperial County				X
Butte County				X	Riverside County (SSAB portion)				X
Colusa County			X		**MOUNTAIN COUNTIES AIR BASIN (MCAB)**				
Glenn County			X		Amador County			X	
Placer County (SVAB portion)				X	Calaveras County			X	
Sacramento County				X	El Dorado County (MCAB portion)			X	
Shasta County			X		Mariposa County			X	
Solano County (SVAB portion)				X	Nevada County			X	
Sutter County				X	Placer County (MCAB portion)			X	
Tehama County			X		Plumas County				X
Yolo County				X	Sierra County			X	
Yuba County			X		Tuolumne County				X
					LAKE COUNTY AIR BASIN				X
					LAKE TAHOE AIR BASIN				X

*** The area designated for carbon monoxide is a county or portion of a county.**

FIGURE 5



Source Date:
August 2006
Air Quality Data Branch, PTSD

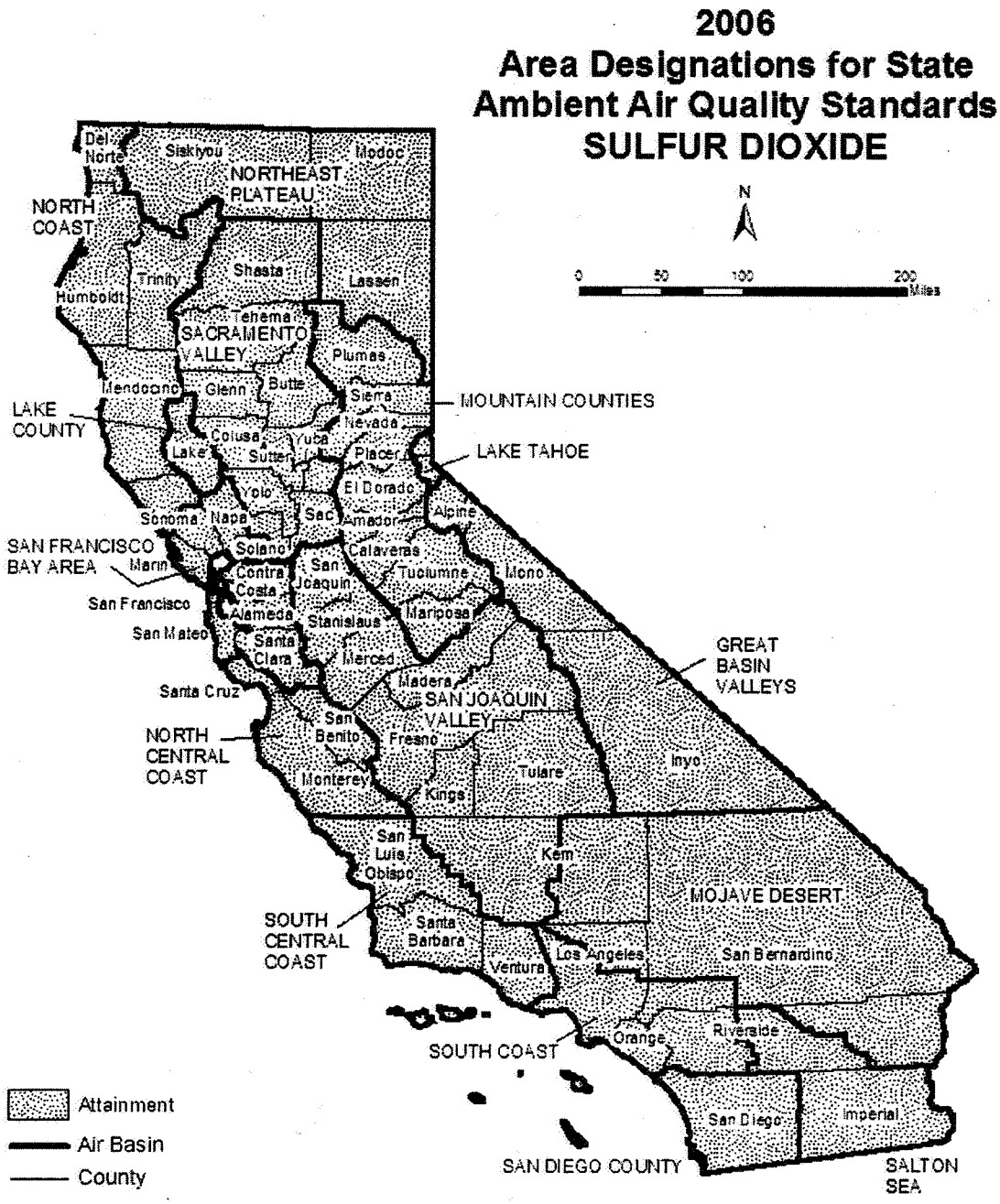
August 24, 2006

TABLE 5

California Ambient Air Quality Standards
Area Designations for Nitrogen Dioxide

	N	NT	U	A		N	NT	U	A
NORTH COAST AIR BASIN				X	SAN JOAQUIN VALLEY AIR BASIN				X
SAN FRANCISCO BAY AREA AIR BASIN				X	GREAT BASIN VALLEYS AIR BASIN				X
NORTH CENTRAL COAST AIR BASIN				X	MOJAVE DESERT AIR BASIN				X
SOUTH CENTRAL COAST AIR BASIN				X	SALTON SEA AIR BASIN				X
SOUTH COAST AIR BASIN				X	MOUNTAIN COUNTIES AIR BASIN				X
SAN DIEGO AIR BASIN				X	LAKE COUNTY AIR BASIN				X
NORTHEAST PLATEAU AIR BASIN				X	LAKE TAHOE AIR BASIN				X
SACRAMENTO VALLEY AIR BASIN				X					

FIGURE 6



Source Date:
August 2006
Air Quality Data Branch, PTSD

August 24, 2006

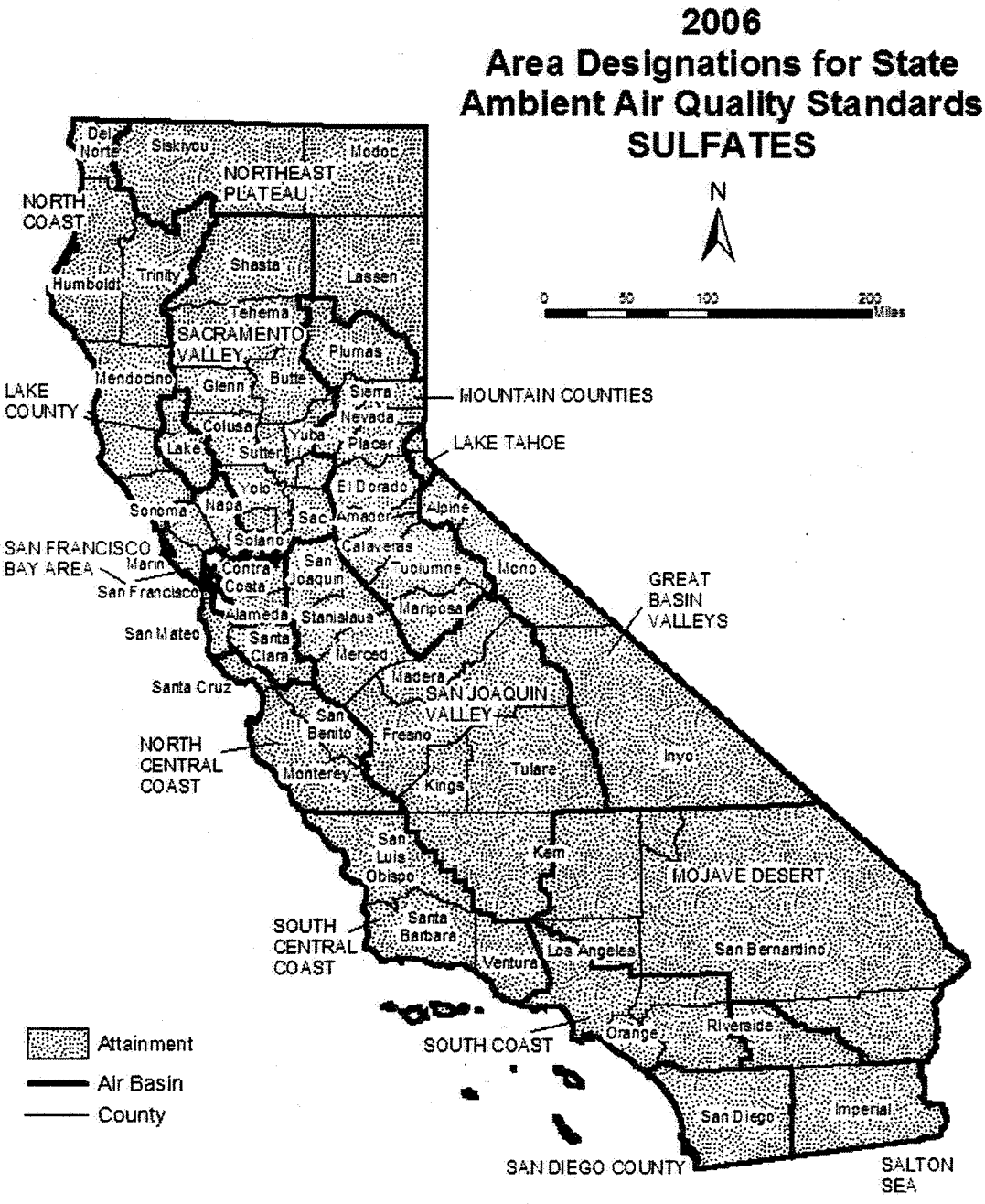
TABLE 6

California Ambient Air Quality Standards
Area Designations for Sulfur Dioxide*

	N	NT	U	A		N	NT	U	A
NORTH COAST AIR BASIN				X	SAN JOAQUIN VALLEY AIR BASIN				X
SAN FRANCISCO BAY AREA AIR BASIN				X	GREAT BASIN VALLEYS AIR BASIN				X
NORTH CENTRAL COAST AIR BASIN				X	MOJAVE DESERT AIR BASIN				X
SOUTH CENTRAL COAST AIR BASIN				X	SALTON SEA AIR BASIN				X
SOUTH COAST AIR BASIN				X	MOUNTAIN COUNTIES AIR BASIN				X
SAN DIEGO AIR BASIN				X	LAKE COUNTY AIR BASIN				X
NORTHEAST PLATEAU AIR BASIN				X	LAKE TAHOE AIR BASIN				X
SACRAMENTO VALLEY AIR BASIN				X					

* The area designated for sulfur dioxide is a county or portion of a county.

FIGURE 7



Source Date:
August 2006
Air Quality Data Branch, PTSD

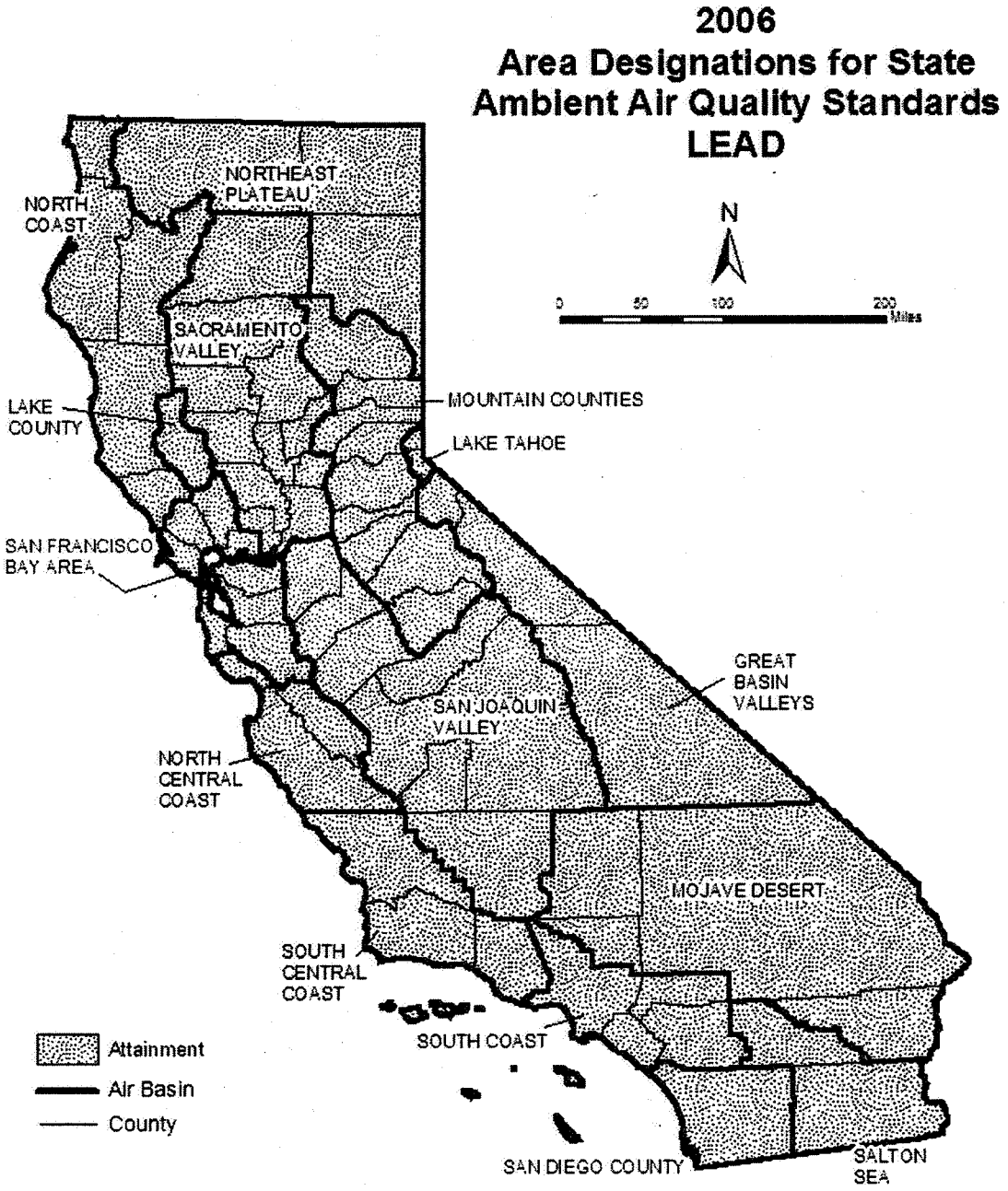
August 24, 2006

TABLE 7

California Ambient Air Quality Standards
Area Designations for Sulfates

	N	U	A		N	U	A
NORTH COAST AIR BASIN			X	SAN JOAQUIN VALLEY AIR BASIN			X
SAN FRANCISCO BAY AREA AIR BASIN			X	GREAT BASIN VALLEYS AIR BASIN			X
NORTH CENTRAL COAST AIR BASIN			X	MOJAVE DESERT AIR BASIN			X
SOUTH CENTRAL COAST AIR BASIN			X	SALTON SEA AIR BASIN			X
SOUTH COAST AIR BASIN			X	MOUNTAIN COUNTIES AIR BASIN			X
SAN DIEGO AIR BASIN			X	LAKE COUNTY AIR BASIN			X
NORTHEAST PLATEAU AIR BASIN			X	LAKE TAHOE AIR BASIN			X
SACRAMENTO VALLEY AIR BASIN			X				

FIGURE 8



Source Date:
August 2006
Air Quality Data Branch, PTSD

August 24, 2006

TABLE 8

California Ambient Air Quality Standards
Area Designations for Lead (particulate)*

	N	U	A		N	U	A
NORTH COAST AIR BASIN			X	SAN JOAQUIN VALLEY AIR BASIN			X
SAN FRANCISCO BAY AREA AIR BASIN			X	GREAT BASIN VALLEYS AIR BASIN			X
NORTH CENTRAL COAST AIR BASIN			X	MOJAVE DESERT AIR BASIN			X
SOUTH CENTRAL COAST AIR BASIN			X	SALTON SEA AIR BASIN			X
SOUTH COAST AIR BASIN			X	MOUNTAIN COUNTIES AIR BASIN			X
SAN DIEGO AIR BASIN			X	LAKE COUNTY AIR BASIN			X
NORTHEAST PLATEAU AIR BASIN			X	LAKE TAHOE AIR BASIN			X
SACRAMENTO VALLEY AIR BASIN			X				

* The area designated for lead is a county or portion of a county.

FIGURE 9

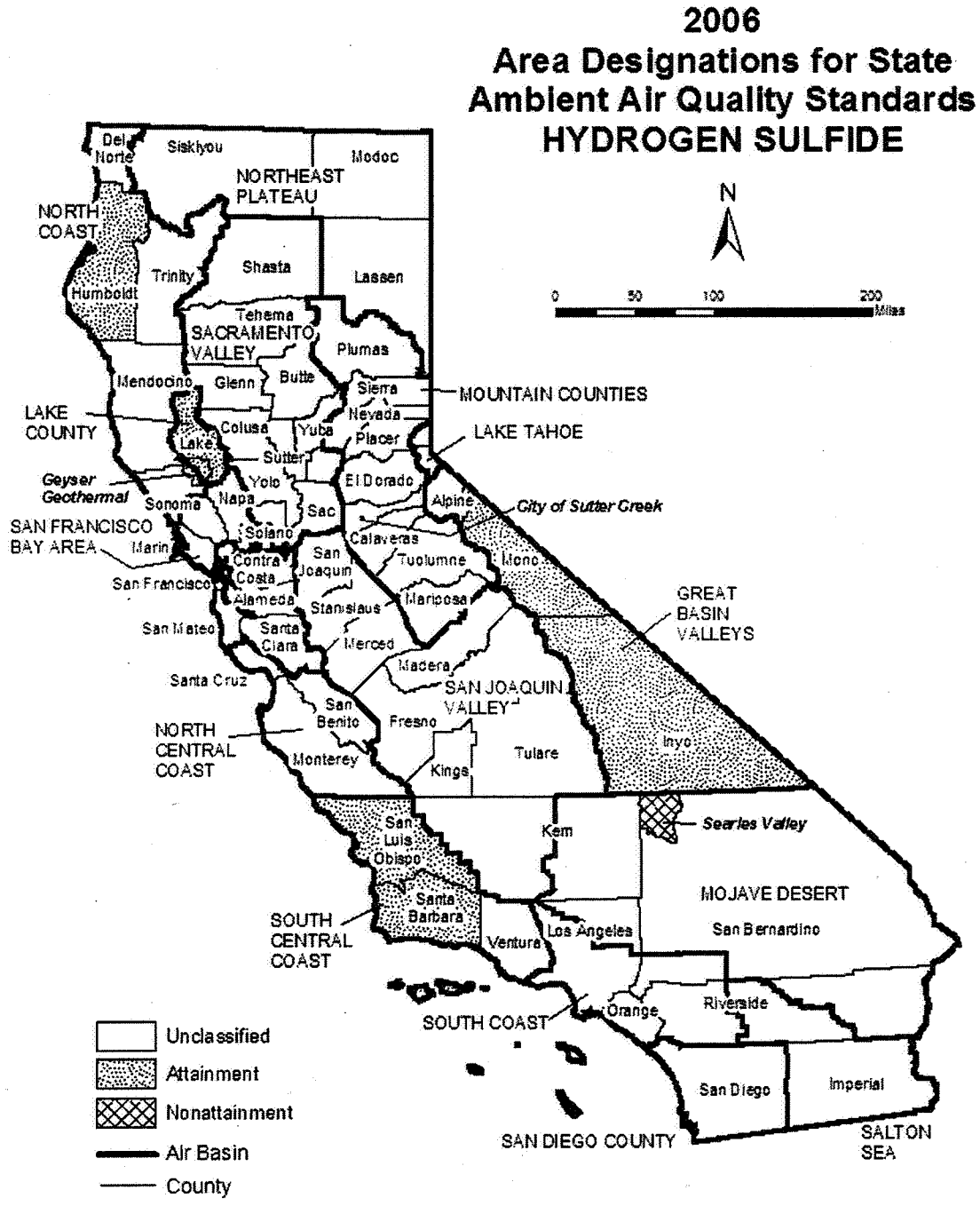

2006
Area Designations for State
Ambient Air Quality Standards
HYDROGEN SULFIDE
N
0 50 100 200 Miles
Del Norte
Siskiyou
Modoc
NORTHEAST PLATEAU
NORTH COAST
Trinity
Shasta
Lassen
Humboldt
Tehama
SACRAMENTO VALLEY
Plumas
Mendocino
Glenn
Butte
Sierra
MOUNTAIN COUNTIES
LAKE COUNTY
Nevada
Colusa
Yuba
Placer
LAKE TAHOE
Lake
Sutter
Geyser Geothermal
Yolo
El Dorado
Sonoma
Napa
Sac
Alpine
City of Sutter Creek
SAN FRANCISCO BAY AREA
Marin
Solano
Calaveras
Contra Costa
San Joaquin
Tuolumne
Mono
San Francisco
Alameda
Stanislaus
Mariposa
GREAT BASIN VALLEYS
San Mateo
Santa Clara
Merced
Madera
Santa Cruz
SAN JOAQUIN VALLEY
San Benito
Fresno
NORTH CENTRAL COAST
Monterey
Kings
Tulare
Inyo
San Luis Obispo
Kern
Searles Valley
MOJAVE DESERT
Santa Barbara
SOUTH CENTRAL COAST
Ventura
Los Angeles
San Bernardino
Orange
Riverside
SOUTH COAST
San Diego
Imperial
SAN DIEGO COUNTY
SALTON SEA
Unclassified
Attainment
Nonattainment
Air Basin
County
Source Date:
August 2006
Air Quality Data Branch, PTSD
August 24, 2006

TABLE 9

California Ambient Air Quality Standards
Area Designations for Hydrogen Sulfide*

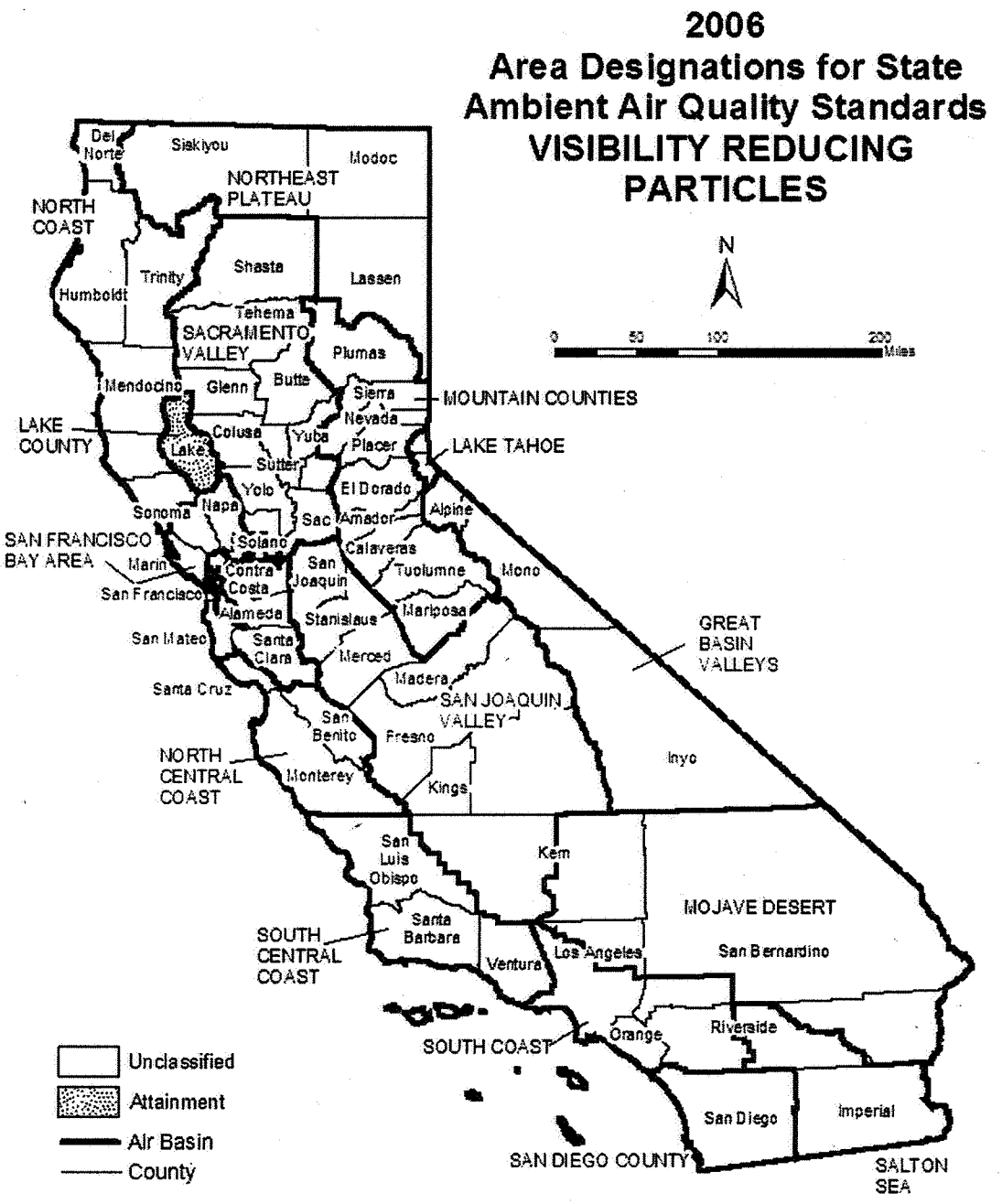
	N	NT	U	A		N	NT	U	A
NORTH COAST AIR BASIN (NCAB)					**MOJAVE DESERT AIR BASIN (MDAB)**				
Del Norte County			X		Kern County (MDAB portion)			X	
Humboldt County				X	Los Angeles County (MDAB portion)			X	
Mendocino County			X		Riverside County (MDAB portion)			X	
Sonoma County (NCAB portion)					San Bernardino County (MDAB portion)				
-Geyser Geothermal Area (1)				X	-Searles Valley Planning Area (2)	X			
-Remainder of County			X		-Remainder of County			X	
Trinity County			X		**SALTON SEA AIR BASIN**			X	
SAN FRANCISCO BAY AREA AIR BASIN			X		**MOUNTAIN COUNTIES AIR BASIN (MCAB)**				
NORTH CENTRAL COAST AIR BASIN			X		Amador County				
SOUTH CENTRAL COAST AIR BASIN					-City of Sutter Creek	X			
San Luis Obispo County				X	-Remainder of County			X	
Santa Barbara County				X	Calaveras County			X	
Ventura County			X		El Dorado County (MCAB portion)			X	
SOUTH COAST AIR BASIN			X		Mariposa County			X	
SAN DIEGO AIR BASIN			X		Nevada County			X	
NORTHEAST PLATEAU AIR BASIN			X		Placer County (MCAB portion)			X	
SACRAMENTO VALLEY AIR BASIN			X		Plumas County			X	
SAN JOAQUIN VALLEY AIR BASIN			X		Sierra County			X	
GREAT BASIN VALLEYS AIR BASIN					Tuolumne County			X	
Alpine County			X		**LAKE COUNTY AIR BASIN**				X
Mono County				X	**LAKE TAHOE AIR BASIN**			X	
Inyo County				X					

*** The area designated for hydrogen sulfide is a county or portion of a county.**

(1) California Code of Regulations, title 17, section 60200(d)

(2) 52 Federal Register 29384 (August 7, 1987)

FIGURE 10



Source Date:
August 2006
Air Quality Data Branch, PTSD

August 24, 2006

TABLE 10

California Ambient Air Quality Standards
Area Designations for Visibility Reducing Particles

	N	NT	U	A		N	NT	U	A
NORTH COAST AIR BASIN			X		SAN JOAQUIN VALLEY AIR BASIN			X	
SAN FRANCISCO BAY AREA AIR BASIN			X		GREAT BASIN VALLEYS AIR BASIN			X	
NORTH CENTRAL COAST AIR BASIN			X		MOJAVE DESERT AIR BASIN			X	
SOUTH CENTRAL COAST AIR BASIN			X		SALTON SEA AIR BASIN			X	
SOUTH COAST AIR BASIN			X		MOUNTAIN COUNTIES AIR BASIN			X	
SAN DIEGO AIR BASIN			X		LAKE COUNTY AIR BASIN				X
NORTHEAST PLATEAU AIR BASIN			X		LAKE TAHOE AIR BASIN			X	
SACRAMENTO VALLEY AIR BASIN			X						

Area Designations for the National Ambient Air Quality Standards

This section contains a description of the area designations for each pollutant for which there is a national ambient air quality standard, except lead. The national lead standard was promulgated after the federal Clean Air Act was amended in 1977, and in promulgating the national lead standard, the U.S. EPA did not require areas to be designated in a manner similar to other pollutants. The area designations for each pollutant are presented in the form of a map and a summary table.

The U.S. EPA uses two categories to designate areas with respect to nitrogen dioxide. These designation categories are:

- Does not meet primary standards, and
- Cannot be classified or better than national standards.

Areas that do not meet the primary national standards for these pollutants are indicated on the following maps and summary tables as "N" for nonattainment. Areas that cannot be classified or are better than the national standards are indicated as "U/A" for unclassified/attainment.

The U.S. EPA uses four categories to designate areas with respect to sulfur dioxide. These designation categories are:

- Does not meet the primary standards,
- Does not meet the secondary standards,
- Cannot be classified, and
- Better than the national standards.

In California, the first two designation categories listed above are not applicable because all areas of California either meet the primary and secondary standards or are unclassifiable. The map and summary table for sulfur dioxide show areas that cannot be classified as "U" for unclassifiable and areas that are better than the national standards as "A" for attainment.

Two categories are used to designate areas with respect to carbon monoxide and fine suspended particulate matter (PM2.5). These designation categories are:

- Nonattainment, and
- Unclassifiable/Attainment.

The revised National PM2.5 standard became effective May 5, 2005.

Finally, the U.S. EPA uses three categories to designate areas with respect to ozone and suspended particulate matter (PM10). These designation categories are:

- Attainment,
- Nonattainment, and
- Unclassifiable.

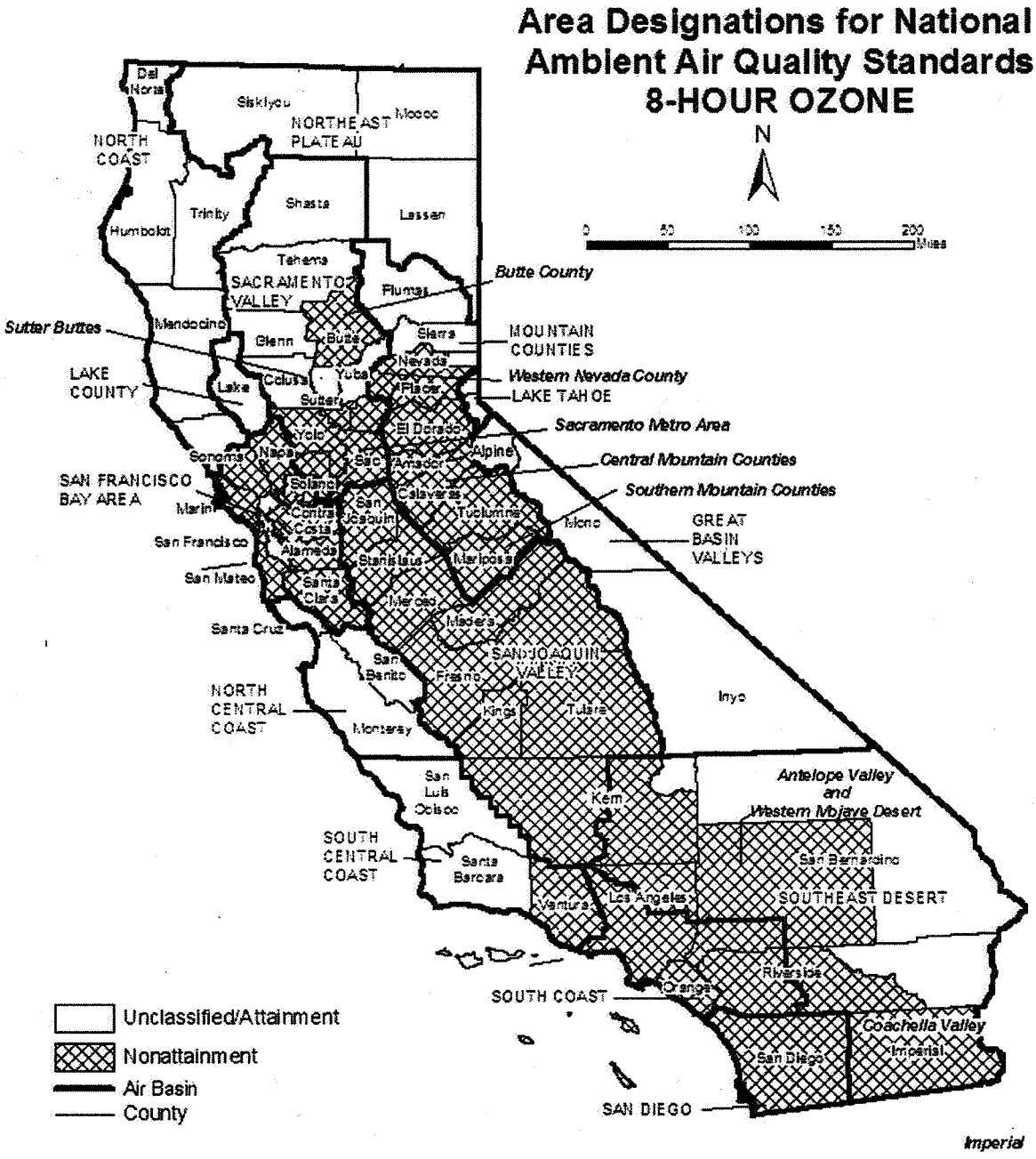
The National 1-hour ozone standard was revoked effective June 15, 2005; the National 8-hour ozone standard is still in effect.

From time to time, the boundaries of the California air basins have been changed to facilitate the planning process. The Board generally initiates these changes, and they are not always reflected in the U.S. EPA's area designations for California. For purposes of consistency, all maps in this attachment reflect area designation boundaries and nomenclature as promulgated by the U.S. EPA. In some cases, these may not be the same as those adopted by the Board. For example, the national area designations reflect the former Southeast Desert Air Basin. In accordance with Health and Safety Code section 39606.1, the Board redefined this area in 1996 to be the Mojave Desert Air Basin and Salton Sea Air Basin. The definitions and boundaries for all areas designated for the national standards can be found in Title 40, Code of Federal Regulations (CFR), Chapter I, Part 81.305. They are available on the web at:

http://www.access.gpo.gov/nara/cfr/waisidx_05/40cfr81_05.html

Once at this website, scroll down to Part 81.305 to view the California area designations.

FIGURE 11



Source Data:
July 2006
Air Quality Data Branch, PTSD

August 22, 2006

TABLE 11

National Ambient Air Quality Standards
Area Designations for 8-Hour Ozone*

	N	U/A		N	U/A
NORTH COAST AIR BASIN		X	**SOUTHEAST DESERT AIR BASIN (SEDAB)**		
SAN FRANCISCO BAY AREA AIR BASIN	X		Kern County (SEDAB portion)	X	
NORTH CENTRAL COAST AIR BASIN		X	Imperial County	X	
SOUTH CENTRAL COAST AIR BASIN			Los Angeles County (SEDAB portion)	X	
San Luis Obispo County		X	Riverside County (SEDAB portion)		
Santa Barbara County		X	- Coachella Valley	X	
Ventura County			- Non-AQMA portion		X
- Area excluding Anacapa and San Nicolas Islands	X		San Bernardino County		
Channel Islands (1)		X	- Western portion (AQMA)	X	
SOUTH COAST AIR BASIN (1)	X		- Eastern portion (non-AQMA)		X
SAN DIEGO COUNTY	X		**MOUNTAIN COUNTIES AIR BASIN (MCAB)**		
NORTHEAST PLATEAU AIR BASIN		X	Central Mountain Counties		
SACRAMENTO VALLEY AIR BASIN (SVAB)			- Amador County	X	
Butte County	X		- Calaveras County	X	
Colusa County		X	Southern Mountain Counties		
Glenn County		X	- Mariposa County	X	
Sacramento Metro Area (2)	X		- Tuolumne County	X	
Shasta County		X	El Dorado County (MCAB portion) (2)	X	
Sutter County			Nevada County		
- Sutter County (Sutter Buttes)	X		- Western Nevada County	X	
- Remainder of North Sutter County		X	- Remainder of County		X
Tehama County		X	Placer County (MCAB portion) (2)	X	
Yuba County		X	Plumas County		X
SAN JOAQUIN VALLEY AIR BASIN	X		Sierra County		X
GREAT BASIN VALLEYS AIR BASIN		X	**LAKE COUNTY AIR BASIN**		X
			LAKE TAHOE AIR BASIN		X

*** Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.**

(1) South Central Coast Air Basin Channel Islands:

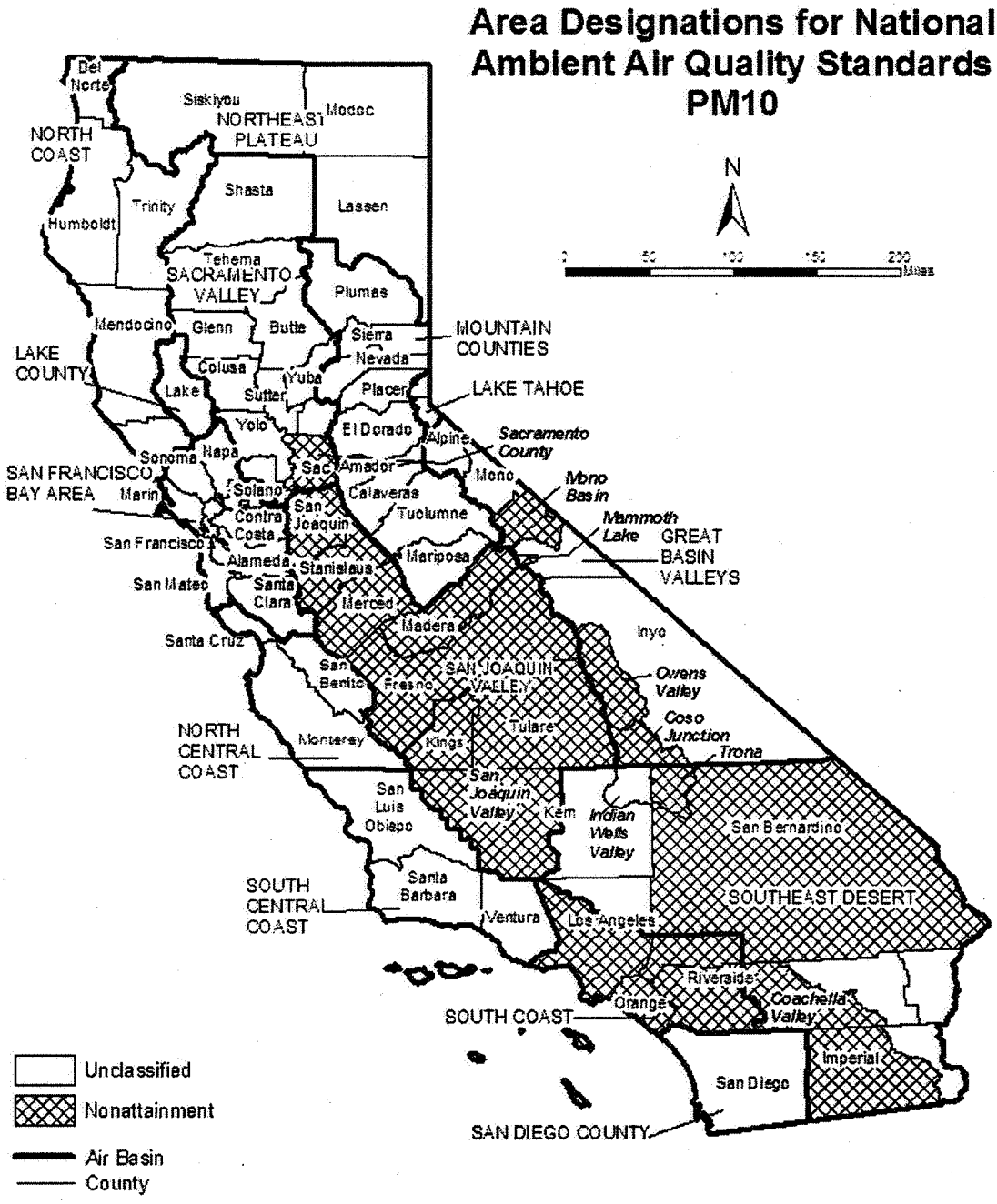
Santa Barbara County includes Santa Cruz, San Miguel, Santa Rosa, and Santa Barbara Islands.

Ventura County includes Anacapa and San Nicolas Islands.

Note that the San Clemente and Santa Catalina Islands are considered part of Los Angeles County, and therefore, are included as part of the South Coast Air Basin.

(2) Sacramento Metro Area comprises all of Sacramento and Yolo counties, the SVAB portion of Solano County, the southern portion of Sutter County, and the SVAB and MCAB portions of Placer and El Dorado counties.

FIGURE 12



Source Date:
July 2005
Air Quality Data Branch, PTSD

August 22, 2006

TABLE 12

National Ambient Air Quality Standards
Area Designations for Suspended Particulate Matter (PM10)*

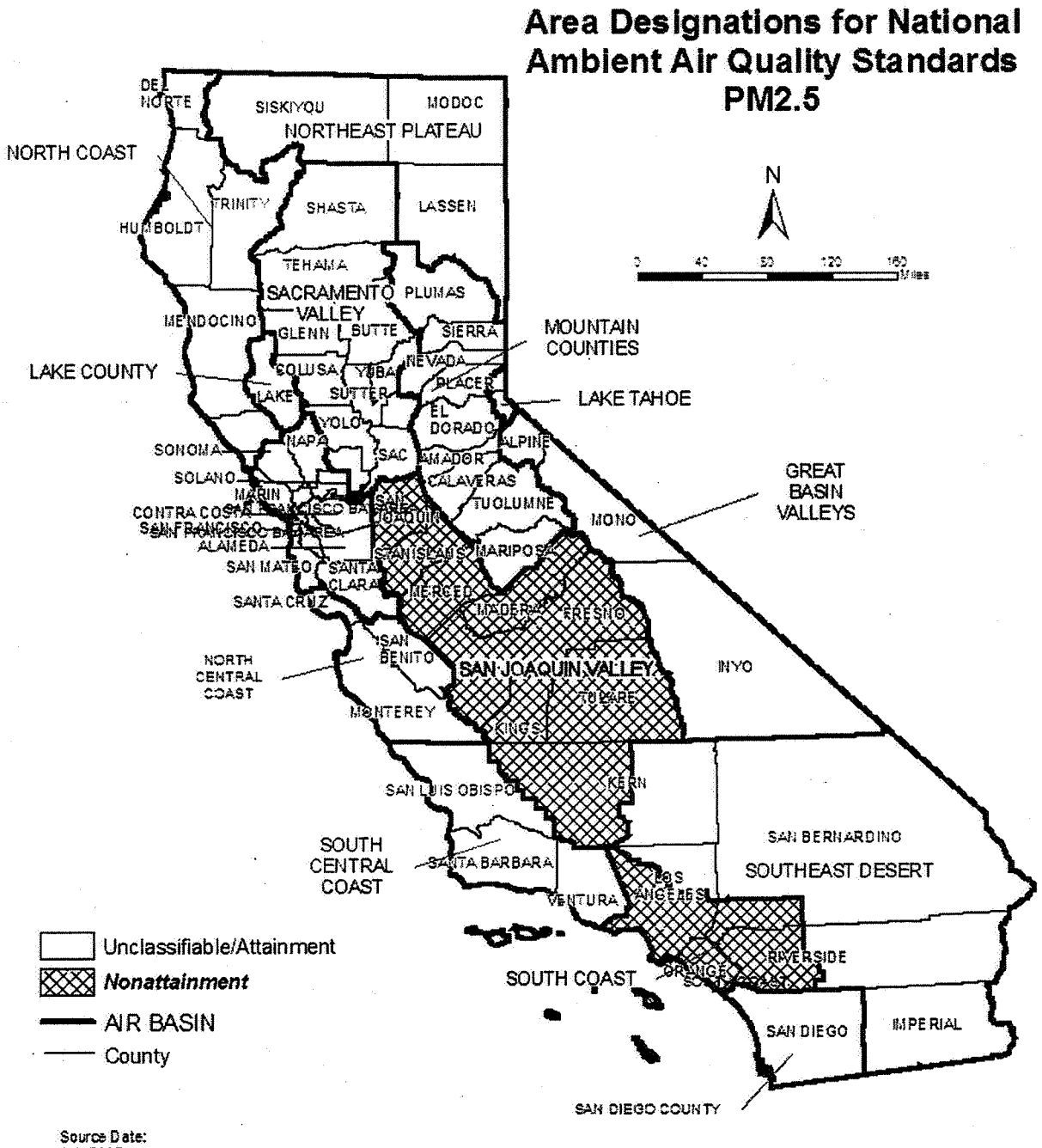
	N	U		N	U
NORTH COAST AIR BASIN		X	**GREAT BASIN VALLEYS AIR BASIN (cont.)**		
SAN FRANCISCO BAY AREA AIR BASIN		X	Mono County		
NORTH CENTRAL COAST AIR BASIN		X	-Mammoth Lake Planning Area	X	
SOUTH CENTRAL COAST AIR BASIN		X	-Mono Lake Basin	X	
SOUTH COAST AIR BASIN	X		-Remainder of County		X
SAN DIEGO COUNTY		X	**SOUTHEAST DESERT AIR BASIN (SEDAB)**		
NORTHEAST PLATEAU AIR BASIN		X	Eastern Kern County		
SACRAMENTO VALLEY AIR BASIN (SVAB)			-Indian Wells Valley		X
Butte County		X	-Remainder of County		X
Colusa County		X	Los Angeles County (SEDAB portion)		X
Glenn County		X	Riverside County		
Sacramento County (1)	X		-Coachella Valley Planning Area	X	
Shasta County		X	-Remainder of County		X
Solano County (SVAB portion)		X	San Bernardino County		
Sutter County		X	-Trona	X	
Tehama County		X	-Remainder of County	X	
Yolo County		X	Imperial County		
Yuba County		X	-Imperial Valley Planning Area	X	
SAN JOAQUIN VALLEY AIR BASIN	X		-Remainder of County		X
GREAT BASIN VALLEYS AIR BASIN			**MOUNTAIN COUNTIES AIR BASIN**		
Alpine County		X	Placer County (SVAB/MCAB portion) (2)		X
Inyo County			Remainder of Air Basin		X
-Owens Valley Planning Area	X		**LAKE COUNTY AIR BASIN**		X
-Coso Junction	X		**LAKE TAHOE AIR BASIN**		X
-Remainder of County		X			

*** Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.**

(1) Sacramento's air quality meets the federal PM10 standards. U.S. EPA is preparing a finding of attainment.

(2) U.S. EPA designation puts the SVAB portion of Placer County in the MCAB.

FIGURE 13



August 22, 2006

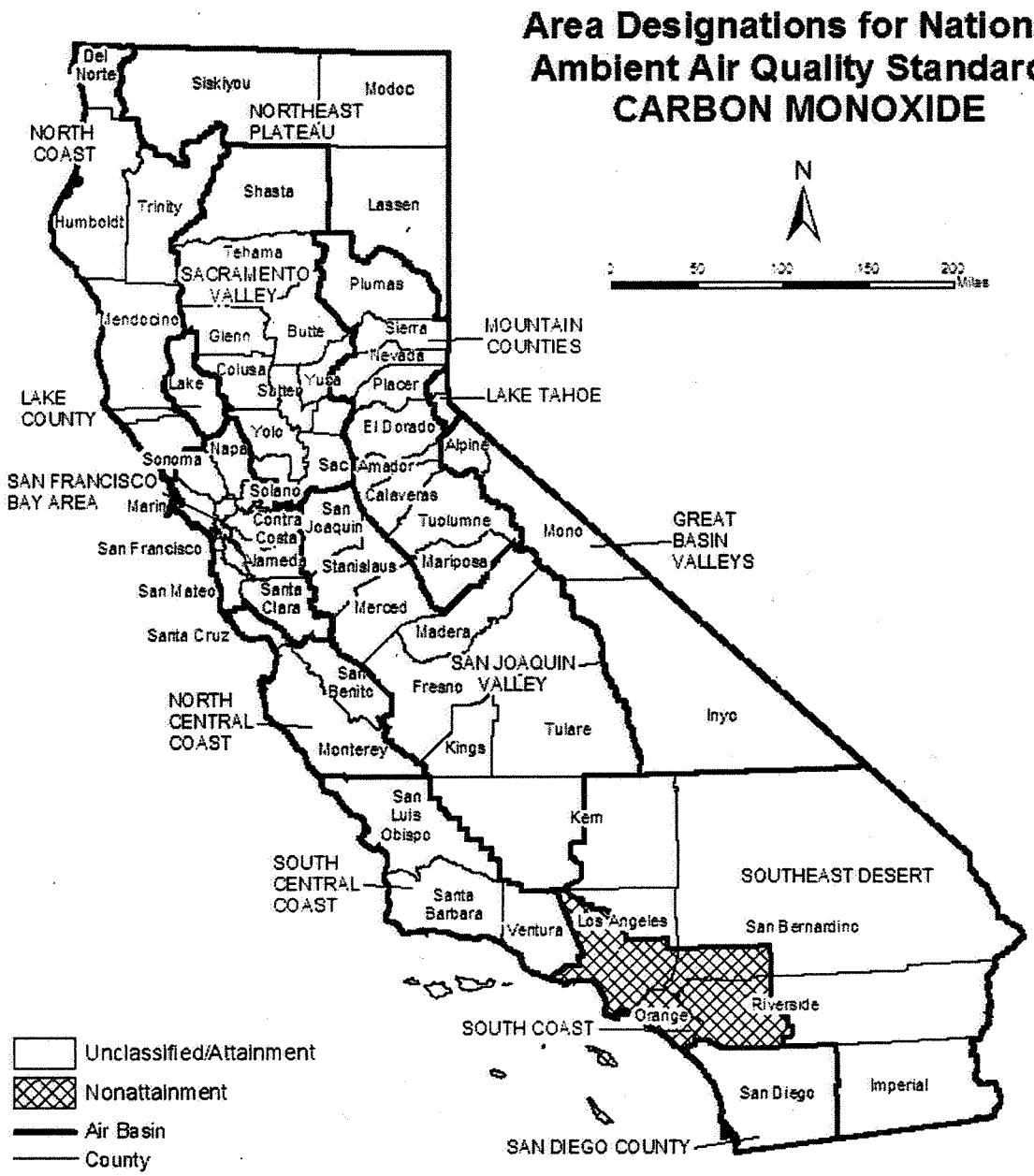
TABLE 13

National Ambient Air Quality Standards
Area Designations for Fine Suspended Particulate Matter (PM2.5)*

	N	U/A		N	U/A
NORTH COAST AIR BASIN		X	SACRAMENTO VALLEY AIR BASIN		X
SAN FRANCISCO BAY AREA AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN	X	
NORTH CENTRAL COAST AIR BASIN		X	GREAT BASIN VALLEYS AIR BASIN		X
SOUTH CENTRAL COAST AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		X
SOUTH COAST AIR BASIN	X		MOUNTAIN COUNTIES AIR BASIN		X
SAN DIEGO COUNTY		X	LAKE COUNTY AIR BASIN		X
NORTHEAST PLATEAU AIR BASIN		X	LAKE TAHOE AIR BASIN		X

*** Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.**

FIGURE 14



Source Date:
July 2005
Air Quality Data Branch, PTSD

August 21, 2006

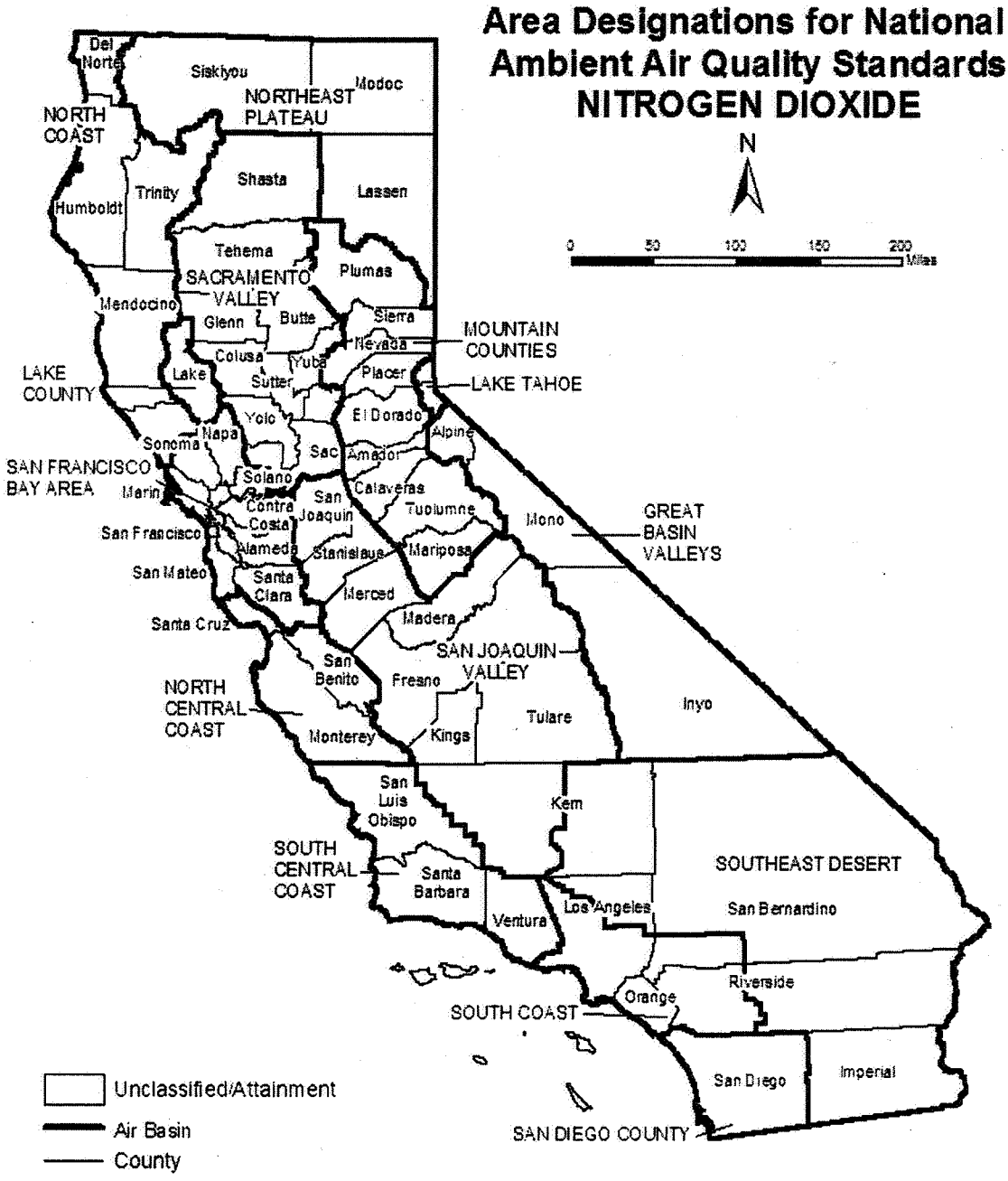
TABLE 14

National Ambient Air Quality Standards
Area Designations for Carbon Monoxide*

	N	U/A		N	U/A
NORTH COAST AIR BASIN		X	SACRAMENTO VALLEY AIR BASIN		X
SAN FRANCISCO BAY AREA AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN		X
NORTH CENTRAL COAST AIR BASIN		X	GREAT BASIN VALLEYS AIR BASIN		X
SOUTH CENTRAL COAST AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		X
SOUTH COAST AIR BASIN (1)	X		MOUNTAIN COUNTIES AIR BASIN		X
SAN DIEGO COUNTY		X	LAKE COUNTY AIR BASIN		X
NORTHEAST PLATEAU AIR BASIN		X	LAKE TAHOE AIR BASIN		X

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.
(1) This area has air quality that meets the national CO standards.

FIGURE 15



Source Date:
July 2005
Air Quality Data Branch, PTSD

August 21, 2006

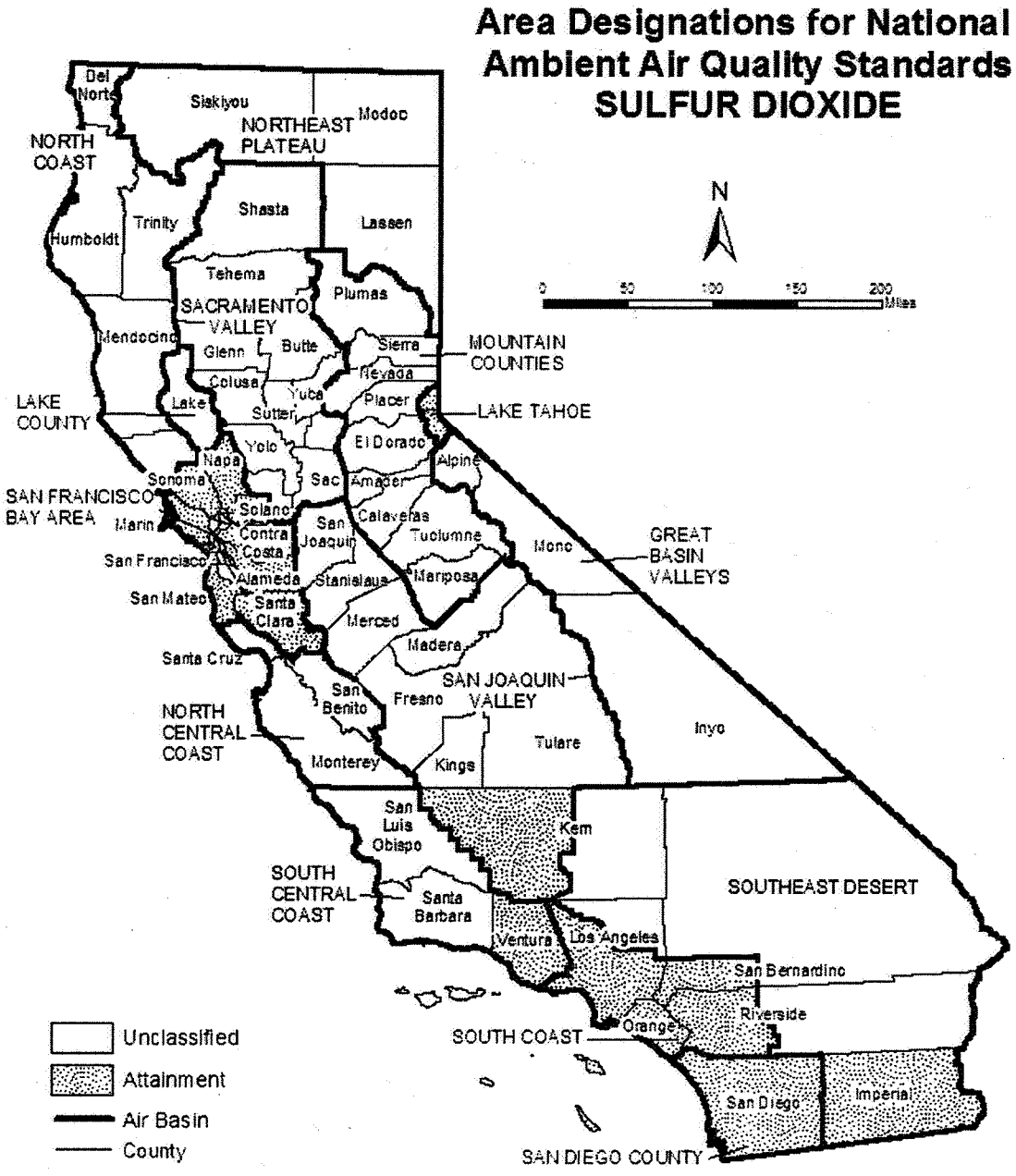
TABLE 15

National Ambient Air Quality Standards
Area Designations for Nitrogen Dioxide*

	N	U/A		N	U/A
NORTH COAST AIR BASIN		X	SACRAMENTO VALLEY AIR BASIN		X
SAN FRANCISCO BAY AREA AIR BASIN		X	SAN JOAQUIN VALLEY AIR BASIN		X
NORTH CENTRAL COAST AIR BASIN		X	GREAT BASIN VALLEYS AIR BASIN		X
SOUTH CENTRAL COAST AIR BASIN		X	SOUTHEAST DESERT AIR BASIN		X
SOUTH COAST AIR BASIN		X	MOUNTAIN COUNTIES AIR BASIN		X
SAN DIEGO COUNTY		X	LAKE COUNTY AIR BASIN		X
NORTHEAST PLATEAU AIR BASIN		X	LAKE TAHOE AIR BASIN		X

* Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.

FIGURE 16



Source Date:
July 2005
Air Quality Data Branch, PTSD

August 21, 2006

TABLE 16

National Ambient Air Quality Standards
Area Designations for Sulfur Dioxide*

	A	U		A	U
NORTH COAST AIR BASIN		X	**SAN JOAQUIN VALLEY AIR BASIN (cont.)**		
SAN FRANCISCO BAY AREA AIR BASIN	X		Kings County		X
NORTH CENTRAL COAST AIR BASIN		X	Madera County		X
SOUTH CENTRAL COAST AIR BASIN			Merced County		X
San Luis Obispo County		X	San Joaquin County		X
Santa Barbara County		X	Stanislaus County		X
Ventura County	X		Tulare County		X
Channel Islands (1)		X	**GREAT BASIN VALLEYS AIR BASIN**		X
SOUTH COAST AIR BASIN (1)	X		**SOUTHEAST DESERT AIR BASIN**		
SAN DIEGO COUNTY	X		Imperial County	X	
NORTHEAST PLATEAU AIR BASIN		X	Remainder of Air Basin		X
SACRAMENTO VALLEY AIR BASIN		X	**MOUNTAIN COUNTIES AIR BASIN**		X
SAN JOAQUIN VALLEY AIR BASIN (SJVAB)			**LAKE COUNTY AIR BASIN**		X
Fresno County		X	**LAKE TAHOE AIR BASIN**	X	
Kern County (SJVAB portion)	X				

*** Definitions and references for all areas can be found in 40 CFR, Chapter I, Part 81.305.**

(1) South Central Coast Air Basin Channel Islands:

Santa Barbara County includes Santa Cruz, San Miguel, Santa Rosa, and Santa Barbara Islands.

Ventura County includes Anacapa and San Nicolas Islands.

Note that the San Clemente and Santa Catalina Islands are considered part of Los Angeles County, and therefore, are included as part of the South Coast Air Basin.

ATTACHMENT D

CONVENTION FOR ROUNDING AMBIENT AIR QUALITY DATA

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ATTACHMENT D

CONVENTION FOR ROUNDING AMBIENT AIR QUALITY DATA

Before ambient air quality measurements are used in designating areas for State standards, they are rounded to the precision of the applicable State standard. In addition, the Expected Peak Day Concentration or EPDC is also rounded to the precision of the State standard before it is used to identify and exclude measurements affected by highly irregular or infrequent events. As described below, the same rounding convention is generally used in all cases.

All raw air quality data are stored in the Board's Aerometric Data Analysis and Management (ADAM) database, as they are reported. However, the reported values and the stored values can and do differ very slightly, because ADAM stores numbers in a floating-point format. For example, a number reported as 1.23 might actually be stored as 1.229999998 or as 1.2300000001. Nonetheless, great care is taken to ensure that these "slight" differences have no impact on calculated values used for area designations.

The precision or given number of decimal places varies for each State standard and depends on how the level of the standard is specified. The given number of decimal places for each State standard and averaging time are summarized in Table D-1.

TABLE D-1
Level and Precision of State Standards

Pollutant	***Averaging Time***	***Level of Standard***	***Given Number of Decimal Places***
Ozone	1-hour	0.09 ppm	2
	8-hour	0.070 ppm	3
Carbon Monoxide	1-hour	20 ppm	0
	8-hour (Lake Tahoe)	6 ppm	0
	8-hour (Rest of State)	9.0 ppm	1
PM10	24-hour	50 $\mu g/m^3$	0
	Annual	20 $\mu g/m^3$	0
PM2.5	Annual	12 $\mu g/m^3$	0
Nitrogen Dioxide	1-hour	0.25 ppm	2
Sulfur Dioxide	1-hour	0.25 ppm	2
	24-hour	0.04 ppm	2
Lead	30-day	1.5 $\mu g/m^3$	1
Sulfates	24-hour	25 $\mu g/m^3$	0
Hydrogen Sulfide	1-hour	0.03 ppm	2

Individual air quality measurements and statistics (air quality values) are generally rounded up or down using the digit just beyond the given number of decimal places and according to standard rounding conventions. Air quality values that are below 5 round down, while those that are equal to or greater than 5 round up. For example, if the given number of decimal places is 1, an air quality value of 2.34567 rounds to 2.3 because 0.04567 is less than 0.05. An air quality value of 2.35012 rounds to 2.4 because 0.05012 is greater than 0.05. Similarly, an air quality value of 2.35000 rounds to 2.4 because 0.05000 exactly equals 0.05.

The method used for determining area designation values is generally consistent across all pollutants. First, if there is a valid EPDC, the EPDC is rounded to the given number of decimal places (refer to Table D-1) for the applicable State standard. Next, all air quality values for the three-year period used in area designations are rounded to the given number of decimal places. All rounded air quality values that are higher than the rounded EPDC are excluded as extreme concentration events and therefore, not considered in the area designation process. The air quality value used to designate an area (the designation value) is the highest rounded value for the previous three-year period that is less than or equal to the rounded EPDC. However, if this air quality value is identified as affected by an exceptional event or unusual concentration event, it is excluded from the area designation process, and the next highest air quality value becomes the designation value.

ATTACHMENT E

PROCEDURE FOR CALCULATING STATE 8-HOUR OZONE CONCENTRATIONS

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ATTACHMENT E

PROCEDURE FOR CALCULATING STATE 8-HOUR OZONE CONCENTRATIONS

Similar to the federal procedure, the State 8-hour ozone averages are based on overlapping 8-hour averages, using the first hour as the start hour and assigning a date to the daily maximum 8-hour average. The first step in calculating a State 8-hour average is to truncate the hourly measurements to 3 decimal places, when expressed in parts per million (ppm). Next, the average of the truncated hourly measurements that are within the 8-hour period (provided there are at least 6 hourly measurements in the period) is calculated. The final step is to round the averaged value to 3 decimal places (consistent with the precision of the State 8-hour standard). Running 8-hour averages are calculated for each hour of the day. The highest 8-hour average for each day is recorded in the database as the 8-hour daily maximum.

ARB's truncation/rounding conventions are not the same as the U.S. EPA conventions, and therefore, can result in slightly different values for equivalent 8-hour periods. The U.S. EPA truncates both the hourly measurements and the resulting 8-hour averages, while ARB truncates the hourly observations but rounds the resulting 8-hour averages. Furthermore, the federal method for calculating 8-hour ozone substitutes a value of 0.0005 ppm (½ the detection limit) for missing hours when an 8-hour period includes fewer than 6 hourly values. This results in a *de minimis* 8-hour average that is considered valid for nonattainment purposes only, if the average exceeds the standard (this practice avoids the problem of non-designations when an area logically must have exceeded the standard). For State purposes, we disregard all 8-hour periods that include fewer than 6 hourly measurements. This approach is consistent with the Representativeness Criteria in Appendix 1 of the designation criteria and is consistent for all pollutants with State standards.

SAMPLE CALCULATION:

Here is a simple example of an 8-hour average calculation:

Hour 1 ozone value: *0.0517 ppm*
Hour 2 ozone value: *0.0658 ppm*
Hour 3 ozone value: *0.0761 ppm*
Hour 4 ozone value: *0.0823 ppm*
Hour 5 ozone value: *0.0906 ppm*
Hour 6 ozone value: *0.0847 ppm*
Hour 7 ozone value: *0.0743 ppm*
Hour 8 ozone value: *0.0615 ppm*

These measured values truncate to:

Hour 1: *0.051 ppm*
Hour 2: *0.065 ppm*
Hour 3: *0.076 ppm*
Hour 4: *0.082 ppm*
Hour 5: *0.090 ppm*
Hour 6: *0.084 ppm*
Hour 7: *0.074 ppm*
Hour 8: *0.061 ppm*

and produce an 8-hour average of:

(0.051 + 0.065 + 0.076 + 0.082 + 0.090 + 0.084 + 0.074 + 0.061) / 8

or:

0.072875 ppm

which rounds to:

0.073 ppm

STATE DESIGNATION REQUIREMENTS:

1. To be used for State regulatory purposes, an 8-hour average must be representative, as determined by Appendix 1 of the designation criteria. This means that an hourly measurement must be the result of at least 30 minutes of sampling to be considered representative, and there must be 6 or more representative hourly measurements within the 8-hour period.
2. For an 8-hour average to be used for State regulatory purposes, it must come from a representative day, as determined by Appendix 1 of the designation criteria. A day is representative when there are 6 or more representative hourly measurements in each third of the day (i.e., hour 0 through hour 7, hour 8 through hour 15, and hour 16 through hour 23), and there are no more than 2 consecutive hourly measurements missing within the day.
3. For designating areas as either "attainment" or "nonattainment-transitional," there must be a sufficient number of representative days during a year for the designation period to be considered complete, as defined by Appendix 3 of the designation criteria. A year is deemed complete when at least 75 percent of the days are representative during each of the high months.

To designate an area as "attainment," there must also be:

- 3 years of complete data when the maximum 8-hour average concentration for those 3 years (after excluding values affected by highly irregular or infrequent events) is between 75% and the level of the standard, or
- 2 years of complete data when the maximum 8-hour average concentration for those 2 years (after excluding values affected by highly irregular or infrequent events) is less than 75%, but at least 50%, of the standard, or
- 1 year of complete data when the maximum 8-hour average concentration for that year (after excluding values affected by highly irregular or infrequent events) is less than 50% of the standard.

ATTACHMENT F

BIBLIOGRAPHY

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ATTACHMENT F

BIBLIOGRAPHY

The following is a list of the documents the staff used in developing the changes to the designation criteria and area designations for State standards documented in this staff report:

1. Area Designations and Maps, 2004, California Air Resources Board, December 2004.

2. Proposed Amendments to the Area Designation Criteria and Area Designations for State Ambient Air Quality Standards and Maps of Area Designations for State and National Ambient Air Quality Standards. California Air Resources Board, December 2003.

3. Classification of Areas of the State as Attainment, Nonattainment, and Unclassified for State Ambient Air Quality Standards for the California Clean Air Act of 1988. California Air Resources Board, April 1989.

TITLE 17. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER ADOPTION OF PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATIONS

The Air Resources Board (Board or ARB) will conduct a public hearing at the time and place noted below to consider adoption of amendments to: (1) the Regulation for Reducing Volatile Organic Compound (VOC) Emissions from Consumer Products; and (2) the Regulation for Reducing the Ozone Formed from Aerosol Coating Product Emissions.

DATE: November 16, 2006

TIME: 9:00 a.m.

PLACE: Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

This item will be considered at a two day meeting of the Board, which will commence at 9:00 a.m., November 16, 2006, and may continue at 8:30 a.m., November 17, 2006. This item may not be considered until November 17, 2006. Please consult the agenda for the meeting, which will be available at least 10 days before November 16, 2006, to determine the day on which this item will be considered.

For individuals with sensory disabilities, this document is available in Braille, large print, audiocassette or computer disk. Please contact ARB's Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at 916-323-7053.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to sections 94508, 94509, 94510, 94513, and 94523 to title 17, California Code of Regulations (CCR). Non-substantial or solely grammatical changes are also proposed to sections 94507, 94511, 94512, 94514, 94515, 94516, and 94517.

Background

Section 41712 of the California Health and Safety Code requires ARB to adopt regulations to achieve the maximum feasible reduction in VOC emissions from consumer products. As part of the regulatory process, ARB must determine that adequate data exist for it to adopt the regulations. ARB must also determine that the

regulations are technologically and commercially feasible, and necessary to carry out the Board's responsibilities under Division 26 of the Health and Safety Code. In addition, Health and Safety Code section 41712(c) provides that no regulation shall be adopted which requires the elimination of a product form.

Pursuant to Health and Safety Code section 41712, ARB has adopted several regulations which are collectively referred to as the "California Consumer Products Regulations." These regulations include: (1) the Regulation for Reducing VOC Emissions from Consumer Products (the "Consumer Products Regulation;" title 17, CCR, sections 94507-94517), and (2) the Regulation for Reducing the Ozone Formed from Aerosol Coating Product Emissions (the "Aerosol Coatings Regulation;" title 17, CCR, section 94520-94528).

On November 15, 1994, ARB adopted the California State Implementation Plan for Ozone (1994 SIP). The SIP serves as California's overall plan for attaining the federal ambient air quality standard for ozone. Achieving additional VOC reductions from consumer products is an important element of the SIP and is necessary to attain state and federal air quality standards.

Description of Proposed Regulatory Action

The proposed regulatory action would amend the existing Consumer Products Regulation by adding and modifying product category definitions and by establishing new VOC limits for 16 product categories. For some of the categories, separate VOC limits are specified for different product forms. Most of the new or modified VOC limits would become effective on December 31, 2008. The remainder would become effective on December 31, 2010.

In addition, various other modifications and clarifications are proposed to the existing regulatory language. These include amending several definitions, amending the VOC limit of "Nail Polish Remover," and re-evaluating the VOC limit, effective date, and category definition for "Electronic Cleaner." A number of minor changes are also proposed to various regulatory provisions in order to correct errors or improve clarity. In addition, an amendment is proposed to section 94523 (Exemptions) of the Aerosol Coatings Regulation. This amendment would clarify that several product categories are exempt from regulation under the Aerosol Coatings Regulation.

The proposed regulatory action would also prohibit the use of three toxic air contaminants – methylene chloride, perchloroethylene, and trichloroethylene – in the regulations on "Bathroom and Tile Cleaner," "Construction, Panel, and Floor Covering Adhesive," "General Purpose Cleaner," and "Oven Cleaner."

In addition to the proposed actions described above, the Board may consider whether to exempt tertiary-Butyl acetate (tBac) from the definition of "Volatile Organic Compound." The Board may also consider whether an exemption for this compound should be accompanied by provisions limiting or prohibiting its use in consumer products.

COMPARABLE FEDERAL REGULATIONS

The U.S. Environmental Protection Agency (U.S. EPA) has promulgated a national consumer products rule under section 183(e) of the federal Clean Air Act: *National Volatile Organic Compound Emission Standards for Consumer Products.* (40 CFR Part 59, subpart C, sections 59.201 et seq.) The rule specifies VOC limits for a number of consumer product categories, and is similar in format to ARB's consumer products regulation. However, there are significant differences between the rules. U.S. EPA's rule applies nationwide to consumer product manufacturers, importers and distributors (but not retailers), while the ARB regulation applies to any person (including retailers) who "sells, supplies, offers for sale, or manufactures consumer products for use in the State of California." U.S. EPA's rule does not regulate a number of product categories that are currently regulated under the ARB regulation. For the categories that are regulated under both rules, many of ARB's limits are more stringent than U.S. EPA's limits. All of the VOC limits in U.S. EPA's rule have an effective date of December 10, 1998, whereas the VOC limits in the ARB regulation and the proposed amendments are phased in from 1993 to 2009. Finally, U.S. EPA's rule has an unlimited "sell-through" period for noncomplying products manufactured before the effective date of the limits, whereas California law allows a three year sell-through period.

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 the rationale for the proposed amendments and a summary of the potential environmental and economic impacts. Copies of the ISOR and the full text of the proposed regulatory language, in strikeout/underline format to allow for comparison with the existing regulations, may be obtained from the Board's Public Information Office, Air Resources Board, 1001 I Street, Visitor and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990, at least 45 days prior to the scheduled hearing (November 16, 2006). These documents are also available on ARB's website listed below, or by contacting the agency contact persons listed below.

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

Inquiries concerning the substance of the proposed regulatory action may be directed to Mr. David Mallory, Manager, Measures Development Section, Stationary Source Division, at (916) 445-8316, email dmallory@arb.ca.gov, or Trish Johnson, Air Pollution Specialist, at (916) 445-3365, email tjohnson@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 Alexa Malik, Regulations Coordinator, (916) 322-4011. 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 http://www.arb.ca.gov/consprod/regact/cpwg2006/cpwg2006.htm

COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED

The determinations of the ARB Executive Officer concerning the cost or savings necessarily incurred by public agencies and private persons and business in reasonable compliance with the proposed regulatory action are presented below.

The ARB Executive Officer has determined that the proposed regulatory action will not create costs or savings, as defined in Government Code section 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, or other nondiscretionary cost or savings to state or local agencies.

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative 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. As explained in the ISOR, the proposed amendments may have a significant adverse impact on some individual businesses but the overall statewide impacts are not expected to be significant.

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 should have minimal impacts on the creation or elimination of jobs within the State of California, minimal impacts on the creation of new businesses and the elimination of existing businesses within the State of California, and minimal impacts on the expansion of businesses currently doing business within the State of California. A detailed assessment of the economic impacts of the proposed amendments can be found in the ISOR.

The Board's Executive Officer has also determined, pursuant to title 1, CCR, section 4, that the proposed regulatory action will affect small businesses.

Before taking final action on the proposed regulatory action, 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 15, 2006**, and addressed to the following:

Postal mail:	Clerk of the Board Air Resources Board 1001 I Street, 23rd Floor Sacramento, California 95814
Electronic submittal:	http://www.arb.ca.gov/lispub/comm/bclist.php
Facsimile submittal:	(916) 322-3928

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 the authority granted to the ARB in sections 39600, 39601, 41511, and 41712 of the Health and Safety Code. This action is proposed to implement, interpret, or make specific sections 39002, 39600, 40000, 41511, and 41712 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 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. Modifications could include, but would not necessarily be limited to, exempting tBac from the definition of "Volatile Organic Compound," and potentially accompanying such an exemption with provisions limiting or prohibiting its use in consumer products.

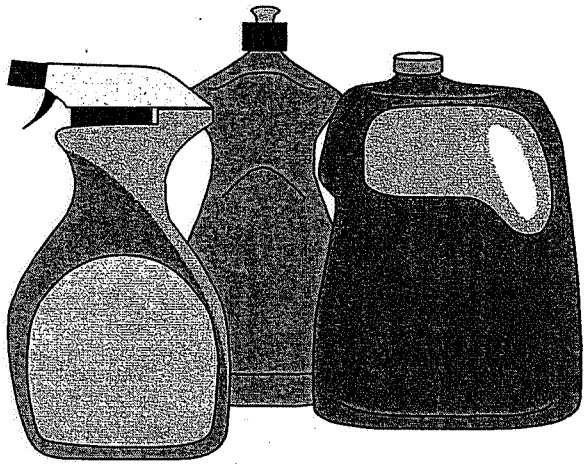
The public may request a copy of the modified regulatory text from the ARB's Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, 1st Floor, Sacramento, California 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD

Catherine Witherspoon
Executive Officer

Date: September 19, 2006

California Environmental Protection Agency
Air Resources Board



PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATION AND THE AEROSOL COATINGS REGULATION

Release Date:
September 29, 2006

State of California
AIR RESOURCES BOARD

INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

Public Hearing to Consider

PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATION AND THE AEROSOL COATINGS REGULATION

To be considered by the Air Resources Board on November 16-17, 2006, at:

Air Resources Board
Cal/EPA Headquarters
California Public Utilities Commission
Auditorium
505 Van Ness Avenue
San Francisco, California 94102

Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

This report has been prepared by the staff of the California Air Resources Board. 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.

State of California
AIR RESOURCES BOARD

PROPOSED AMENDMENTS TO THE CALIFORNIA CONSUMER PRODUCTS REGULATION AND THE AEROSOL COATINGS REGULATION

Prepared by:

Stationary Source Division
Air Resources Board

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September 2006

ACKNOWLEDGMENTS

This report and the proposed amendments to the consumer products regulation and aerosol coatings regulation were developed by the following Air Resources Board staff:

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Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation

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State of California
AIR RESOURCES BOARD

Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation

Executive Summary

EXECUTIVE SUMMARY

A. INTRODUCTION

This Executive Summary, together with Appendix A, the Technical Support Document (TSD), represents the Initial Statement of Reasons for Proposed Rulemaking required by the California Administrative Procedures Act. In these reports, the Air Resources Board (ARB/Board) staff presents the proposed amendments (the "2006 Amendments") to the California Regulation for Reducing Volatile Organic Compound (VOC) Emissions from Consumer Products (the "Consumer Products Regulation"), and amendments to the Regulation for Reducing the Ozone Formed from Aerosol Coating Product Emissions (the "Aerosol Coatings Regulation"). Appendix B contains the proposed amendments for each regulation.

The proposed 2006 Amendments are designed to meet three objectives: (1) the ARB's statutory requirement to achieve the maximum feasible reductions from consumer products; (2) the 2003 State and Federal State Implementation Plan for Ozone (SIP) commitments for Consumer Products; and (3) fulfill certain requirements of a lawsuit settlement agreement with environmental groups regarding ARB's progress under the SIP (U.S. District Court, Central District of CA, Case No. CV-97-6916 JSL (SHx)). Additional proposed amendments are tentatively planned for Board consideration in March 2007 (the "2007 Amendments"). This rulemaking will consider related proposals that have been deferred at the request of interested stakeholders to allow more time for review of technical issues.

The proposed 2006 Amendments will set 18 new VOC limits affecting 15 product categories achieving 10.6 tons per day (tpd) VOC emission reduction statewide by 2008 and 11.5 tpd by 2010, equivalent to a 4.9 tpd emission reduction in the South Coast Air Basin by 2010.

Other proposed amendments will clarify the definitions of the multi-function product categories of "Multi-purpose Solvent" and "Paint Thinner," and clarify overlapping requirements in the Consumer Products Regulation and in the Aerosol Coatings Regulation, applicable to Rubber and Vinyl Protectants, Fabric Protectants, Vinyl/Fabric/Leather/Polycarbonate Coatings, cosmetic products, and other products used on the human body. Other amendments will prohibit the use of chlorinated toxic compounds in certain categories; adjust the VOC limit for Nail Polish Removers; and exempt certain electronic cleaners from a soon-to-be-effective VOC limit.

In this Executive Summary, we provide a discussion of the staff's proposed amendments to the Consumer Products Regulation and the Aerosol Coatings Regulation, and explain the rationale for the proposed changes. A more detailed discussion in Chapter V of the Technical Support Document (Appendix A) is intended to satisfy the requirements of Government Code section 11346.2(a)(1), which requires that a "plain English" summary of the regulations be made available to the public.

B. HISTORY AND BACKGROUND

1. Consumer Products Emissions

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. Emissions from other paint products, such as furniture or architectural coatings, are not part of ARB's consumer products program because local air pollution control and air quality management districts (local air districts) regulate these products.

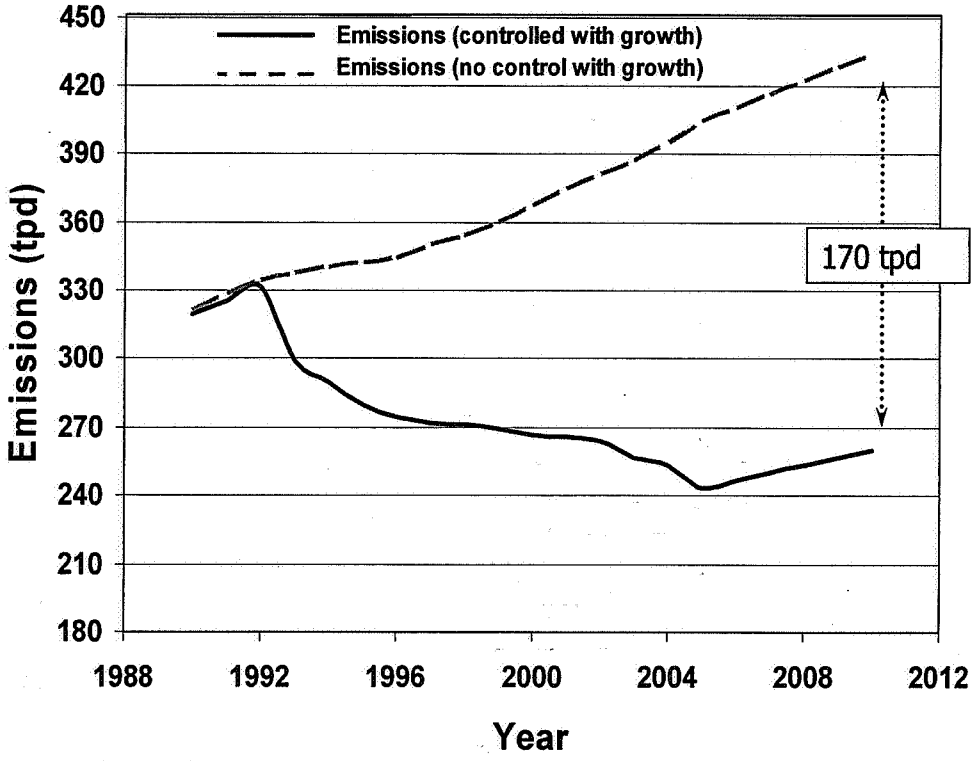
Consumer products are a significant source of reactive organic gas (ROG) emissions in California and contribute to the formation of both ozone and particulate matter pollution. Although each consumer product may seem to be a small source of emissions, the cumulative use of these products by over 37 million Californians results in significant emissions. Consumer products accounted for approximately 260 tpd of ROG emissions in the year 2005, which comprised about eleven percent of the total anthropogenic ROG emissions statewide. Even though significant reductions from control measures adopted by ARB are factored in, growth is projected to cause consumer products emissions to be 270 tpd or about 12 percent of the ROG emissions by 2010. Further reductions in ROG emissions from consumer products and other ROG sources are needed if ozone standards are to be achieved.

The Board has adopted five consumer product regulations over the last fifteen years. As a result of these measures, statewide emissions from consumer products were reduced by over 170 tpd VOC (40 percent reduction) in 2010. The Consumer Products Regulations use the term volatile organic compound (VOC), consistent with California State Law, as opposed to ROG, consistent to federal law, but they are roughly equivalent (ARB, 2006a; ARB, 2006b)[1]. Without additional controls, population growth is expected to reverse the downward trend of emissions from Consumer Products beginning in 2008 achieved by the standards taking effect in 2006. See Figure 1 below.

Together with significant reductions from stationary industrial facilities, mobile sources, and other area-wide sources, such as architectural coatings and petroleum marketing, the reductions in the consumer products element of the SIP are an essential part of California's effort to attain air quality standards. As demonstrated by Table 1 and Table 2 below, emissions from Consumer Products, in 2020, will be the largest source of VOC emissions in the South Coast Air Basin, and the third largest source in the San Joaquin Valley Air Basin, and comprise 24.5 percent and 8.8 percent of the VOC emissions respectively.

[1] The term VOC is used throughout this report.

Figure 1
Consumer Products Emissions and Reductions 1990-2010



Source: ARB 2006 Almanac

Table 1
Top Ten Emitting Categories in the South Coast Air Basin in 2010 and 2020

2010 Ranking	2020 Ranking	Source Category	2010 VOC (tpd)	2010 % of Total	2020 VOC (tpd)	2020 % of Total
2	1	Consumer Products	112.0	19.8%	120.7	24.5%
1	2	Light Duty Passenger Cars	159.8	28.2%	86.8	17.6%
4	3	Coatings (Paints and Thinners - non architectural)	33.3	5.9%	38.0	7.7%
3	4	Off-Road Equipment (Lawn and Garden)	34.2	6.0%	31.1	6.3%
5	5	Architectural Coatings (Paints and Thinners)	25.5	4.5%	28.5	5.8%
7	6	Petroleum Marketing (Gasoline Evaporative Losses)	21.7	3.8%	23.2	4.7%
9	7	Degreasing	15.5	2.7%	17.5	3.6%
8	8	Heavy Duty Gas Trucks	19.3	3.4%	13.5	2.8%
6	9	Recreational Boats	21.8	3.8%	13.0	2.7%
12	10	Chemical (Process and Storage Losses)	10.0	1.8%	11.7	2.4%
10	11	Gas Cans	10.2	1.8%	10.8	2.2%
-	-	Other Sources	103.5	18.3%	97.4	19.7%
-	-	**Total**	**566.8**	**100%**	**492.2**	**100%**

Source: ARB 2006 Almanac

Table 2
Top Ten Emitting Categories in the San Joaquin Valley Air Basin in 2010 and 2020

2010 Ranking	2020 Ranking	Source Category	2010 VOC (tpd)	2010 % of Total	2020 VOC (tpd)	2020 % of Total
3	1	Livestock Waste (Dairy Cattle)	45.0	11.5%	59.8	15.7%
1	2	Prescribed Burning	48.1	12.4%	47.1	12.3%
4	3	Consumer Products	27.8	7.2%	33.4	8.8%
5	4	Oil and Gas Production (Evaporative Losses)	26.7	6.9%	23.8	6.2%
2	5	Light Duty Passenger Cars	45.0	11.6%	23.4	6.1%
6	6	Pesticides	22.6	5.8%	21.8	5.7%
7	7	Coatings (Paints and Thinners – Non Architectural)	13.8	3.5%	17.4	4.6%
9	8	Petroleum Marketing (Gasoline Evaporative Losses)	11.5	3.0%	13.2	3.5%
8	9	Food and Agriculture (Crop Processing and Wineries)	12.0	3.1%	13.1	3.4%
10	10	Architectural Coatings (Paints and Thinners)	9.8	2.5%	10.8	2.8%
-	-	Other Sources	127.1	32.5%	117.8	30.9%
-	-	**Total**	**389.4**	**100%**	**381.6**	**100%**

Source: ARB 2006 Almanac

2. Existing Consumer Product Regulations

In 1988, the Legislature enacted the California Clean Air Act (CCAA or "the Act"). The CCAA specified that attainment of the California State ambient air quality standard is necessary to promote and protect public health, particularly of children, older people, and those with respiratory diseases. The Legislature also directed that these standards be attained by the earliest practicable date. The State ambient air quality standards are more stringent than the federal standards.

The CCAA added section 41712 to the California Health and Safety Code (HSC). This section gave ARB the authority to adopt regulations to achieve the maximum feasible reduction in volatile organic compounds emitted by consumer products. As part of the regulatory adoption process, the ARB must determine that adequate data exist for the adopting regulations. The ARB must also find that the regulations are necessary, technologically and commercially feasible, and do not eliminate a product form. In enacting section 41712, the Legislature gave the ARB clear new authority to control emissions from consumer products, an area that had previously been subject to very few air pollution control regulations.

To date, the Board has adopted the following regulations to fulfill the requirements of the California Clean Air Act as it pertains to consumer products:

- Antiperspirants and Deodorants Regulation
- Consumer Products Regulation
- Aerosol Coatings Regulation
- Alternative Control Plan
- Hairspray Credit Program Regulation

The Antiperspirants and Deodorants Regulation set emission standards and other requirements for only antiperspirants and deodorants. The Consumer Products Regulation set VOC limits and other requirements for 112 categories of household and institutional products such as detergents, cleaning compounds, polishes, floor finishes, cosmetics, personal care products, home, lawn and garden products, disinfectants, sanitizers and automotive specialty products. The Aerosol Coatings Regulation establishes set emissions standards and other requirements for 36 categories of pressurized coatings products including but not limited to spray paints. The Alternative Control Plan provides an alternative method to comply with the VOC standards for consumer products and aerosol coating products set forth in the Consumer Products Regulation and the Aerosol Coatings Regulation. The Hairspray Credit Program Regulation set forth a voluntary program that provided rewards and incentives for early and over compliance with the second-tier 55 percent VOC standard for Hairsprays.

Details pertaining to each of the above listed regulations can be found in Appendix E of the Technical Support Document for this rulemaking.

3. California's SIP and Consumer Products

On October 23, 2003, the ARB adopted *the Proposed 2003 State and Federal Strategy for the California State Implementation Plan* (2003 Statewide Strategy) (ARB, 2003). This action reaffirmed 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. The 2003 Statewide Strategy identifies the Board's near-term regulatory agenda to reduce ozone and particulate matter by establishing enforceable targets under which new measures are developed and adopted for each year from 2003 to 2008. Nineteen specific measures were included under this plan for Board consideration. In addition to meeting federal requirements, this Statewide Strategy ensures continued progress towards California's own health-based air quality standards.

The South Coast Air Quality Management District adopted the 2003 Air Quality Management Plan on August 1, 2003. The ARB approved the local SIP element and the State and federal strategy on October 23, 2003, and on January 9, 2004, the ARB submitted to the United States Environmental Protection Agency (U.S. EPA) both the Statewide Strategy and the 2003 South Coast SIP as revisions to the California SIP. Thus, the elements of 2003 Statewide Strategy became part of the California SIP submittal package. Further, the emissions benefits of the statewide measures identified would then be realized not only in the South Coast Air Basin, but statewide. The 2003 SIP updates all elements of the approved 1994 SIP and includes additional consumer products measures. The San Joaquin Valley Unified Air Pollution Control District adopted the 2004 State Implementation Plan for Ozone in the San Joaquin Valley on October 8, 2004. The ARB approved the 2004 San Joaquin Valley SIP on October 28, 2004, and submitted it to the U.S. EPA for federal approval on November 15, 2004, as a revision to the California SIP.

Two specific measures (with the first completed and the second in progress) and one longer term, less specific measure from the Statewide Strategy and the 2003 South Coast SIP, are intended to reduce emissions from consumer products:

- **Measure CONS-1: Set New Consumer Products Limits for 2006.** In the 2003 Statewide Strategy, ARB committed to present a measure to the Board by 2004 (2004 Amendments). The measure would achieve VOC emission reductions from consumer products of at least 2.3 tons per day (tpd) in the South Coast Air Basin in 2010. Statewide, this measure would achieve 5.3 tpd in emission reductions by 2010. The ARB has fulfilled this commitment. On June 26, 2004, the Board adopted a CONS-1 measure (the "2004 Amendments"), which will achieve 3.0 tpd in VOC emission reductions in the South Coast Air Basin by 2010, and achieve 6.9 tpd in VOC emission reductions statewide by 2010. The adopted CONS-1 measure became legally effective on June 20, 2005, with implementation of the CONS-1 VOC limits beginning on December 31, 2006 (ARB, 2004).

- **Measure CONS-2: Set New Consumer Products Limits for 2008-2010.** The ARB also committed to present new consumer product category limits to the Board between 2006 and 2008 that would achieve VOC emission reductions from consumer products of between 8.5 tpd and 15 tpd in the South Coast Air Basin in 2010. Statewide, this measure would achieve 20-35 tpd in emission reductions by 2010.

  The current proposal is intended to partially fulfill ARB's commitment for CONS-2 and will achieve 4.9 tpd in VOC emission reductions in the South Coast Air Basin by 2010, and 11.5 tpd in VOC emission reductions statewide by 2010. We are developing a subsequent proposal for presentation to the Board in March 2007 (the "2007 Amendments"), to consider related proposals that have been deferred at the request of interested stakeholders to allow more time for review of technical issues.

  The remainder of the CONS-2 commitment is expected to be fulfilled with further rulemakings, beginning in 2007 with preparation of the 2006 sales year survey package (2006 Survey) for distribution to industry. Rule adoption is scheduled for 2008, with rule implementation in 2010.

- **Further Reductions from Consumer Products.** In addition, it is expected that further emission reductions will be needed from all source categories, including consumer products, to meet the long-term emission reduction targets included in the South Coast SIP. As such, there is an ongoing commitment to pursue additional technologically and commercially feasible reductions in consumer product emissions.

On April 15, 2004, U.S. EPA designated 15 areas of California nonattainment for the new eight-hour ozone standard effective June 15, 2004. Many, but not all of these areas, were nonattainment for the federal one-hour standard. New nonattainment areas include a number of rural Sierra foothill counties and additional parts of the Sacramento Valley. The one-hour standard was 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.[2] In order to maintain progress towards clean air, the federal Clean Air Act requires that all emission reduction commitments and specific measures identified in the 2003 Statewide Strategy must be fulfilled, even though the 2003 SIP has not been "approved" by U.S. EPA. In addition, 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.

4. SIP Lawsuit and Settlement

In 1997, three environmental groups (Communities for a Better Environment, the Coalition for Clean Air, and the Natural Resources Defense Council) filed a complaint in

[2] On September 21, 2006 U.S. EPA announced a more stringent 24-hour PM standard. Final designations for the new standard are scheduled to be promulgated in 2009 (U.S. EPA, 2006).

the United States District Court for the Central District of California. The lawsuit was filed against the ARB, the South Coast Air Quality Management District, and the U.S. EPA related to California's progress in achieving the 1994 SIP commitments. The ARB reached a settlement agreement with these groups in January 1999 which was amended in December 1999 and June 2003 (U.S. District Court, Central District of CA, Case No. CV-97-6916 JSL (SHx)). Although the 2003 SIP revision is intended to replace the State's original commitments under the 1994 SIP for the South Coast, the settlement agreement will remain in place until the ARB fulfills its obligations under the agreement.

The agreement included a list of measures to be considered by the ARB and a schedule. The agreement listed a measure applicable to consumer products, for which the ARB staff committed to propose to the Board by June 30, 2004, for a 2 tpd VOC emission reduction in the South Coast Air Basin, if feasible, for implementation in 2006. The ARB adoption of the CONS-1 measure (the 2004 Amendments) fulfilled (and actually exceeded) this commitment, with a VOC reduction of 2.8 tpd in the South Coast Air Basin in 2006, thereby partially fulfilling the remaining VOC reduction commitment in the lawsuit settlement agreement. The agreement listed a second measure applicable to consumer products, for which ARB staff committed to a 4 to 8 tpd VOC emission reduction in the South Coast Air Basin, if feasible, for implementation in 2008. The proposals for CONS-2 (the current 2006 Amendments, and the 2007 Amendments), along with the adopted CONS-1 measure (the 2004 Amendments), are intended to fulfill all ARB commitments in the agreement pertaining to consumer products.

C. SUMMARY OF PROPOSED AMENDMENTS

1. Why are we proposing amendments to the Consumer Products Regulation and the Aerosol Coatings Regulation?

We are proposing amendments to partially meet our SIP commitment for 2006-2008, termed "CONS-2," and to fulfill certain conditions of a SIP lawsuit settlement agreement. In addition, these reductions are necessary to demonstrate continued progress in achieving state and federal ambient air quality standards. These three commitments are discussed in Subsection B of this Executive Summary. Specifically, the 2006 Amendments will partially fulfill CONS-2, achieving at least 11.5 tpd VOC emission reduction statewide by 2010, and it will achieve a 4.9 tpd emission reduction in the South Coast Air Basin by 2010. The 2006 Amendments and associated VOC emission reductions will also fulfill all commitments pertaining to consumer products in the SIP lawsuit settlement agreement.

2. What product categories are covered under the proposed 2006 Amendments?

The proposed 2006 Amendments will set new VOC limits for 15 consumer product categories. As shown in Table 3 below, these include 3 new categories, including subcategories, for which new product category definitions and VOC limits are proposed.

Table 3
Product Categories Covered by Proposed 2006 Amendments

New Categories with VOC Limits for Regulation
Disinfectant Sanitizer Temporary Hair Color
Previously Regulated Category with More Restrictive Limit
Automotive Windshield Washer Fluid (Type A) Bathroom and Tile Cleaner Brake Cleaner (formerly Automotive Brake Cleaner) Carburetor or Fuel-Injection Air Intake Cleaner Construction, Panel and Floor Covering Adhesive Engine Degreaser Floor Polish or Wax (for resilient flooring material) Floor Polish or Wax (for nonresilient flooring material) Furniture Maintenance Product General Purpose Cleaner General Purpose Degreaser Laundry Starch/Sizing/Fabric Finish Product (formerly Laundry Starch Products) Oven Cleaner
Previously Defined or Regulated Categories With Clarifications or Additional Requirements
Electronic Cleaner Fabric Protectant Multi-Purpose Solvent Nail Polish Remover Paint Thinner Rubber/Vinyl Protectant

3. What are the proposed VOC limits for the 15 categories?

The proposed VOC limits are shown in Table 4. The table also shows the reductions that would be achieved by each proposed limit. In addition, the table lists those proposed actions that will cause very small emissions increases from two categories. These small increases will be mitigated by the nearly 12 tpd VOC reductions resulting from the new proposed VOC limits.

4. What are the emission reduction benefits from the proposed 2006 Amendments?

The statewide VOC emissions reductions from 2008 implementation of the proposed limits for 13 of the 15 categories is estimated to be about 10.6 tpd by 2008. In the South Coast, the reductions will be about 4.5 tpd. These reductions meet our SIP lawsuit settlement commitment of 4 to 8 tpd in the South Coast Air Basin by 2008. By 2010, the total expected statewide emission reductions will be about 11.5 tpd, and in the South Coast, about 4.9 tpd.

5. Are any of the categories proposed for new VOC limits "Health Benefit Products"?

Yes, the Disinfectant and Sanitizer categories contain Health Benefit Products. As required by the California Health and Safety Code, staff consulted with public health experts, including representatives from the Centers For Disease Control (CDC), the Food and Drug Administration (FDA), and the California Department of Health Services (DHS). As shown in Table 4 below, we are proposing a 70 percent and 1 percent limit for aerosol and non-aerosol Disinfectant and Sanitizer, respectively. Staff is continuing to work with DHS staff to ensure that the proposed limits do not adversely impact the efficacy of Disinfectants and Sanitizers. Representatives from CDC, DHS, and FDA indicated that it was not appropriate to regulate hand sanitizers. Therefore, we removed the proposed VOC limit for hand sanitizers from consideration in this and the proposed 2007 Rulemaking.

6. What other amendments to the Consumer Products and Aerosol Coatings Regulations are being proposed?

Other amendments will clarify the definitions of the multi-function product categories of Multi-Purpose Solvent and Paint Thinner, and clarify overlapping requirements in the Consumer Products Regulation and in the Aerosol Coating Products Regulation, applicable to the Rubber and Vinyl Protectants, Fabric Protectants, Vinyl/Fabric/Leather/Polycarbonate Coatings, cosmetic products, and other products used on the human body. Other amendments will prohibit the use of chlorinated toxic compounds in certain categories; adjust the VOC limit for Nail Polish Removers; and exempt certain electronic cleaners from a soon-to-be-effective VOC limit.

Table 4
Proposed VOC Limits and Reductions Achieved

Product Category	Product Form	Proposed VOC Limit (wt %)	VOC Emission Reductions (tpd)[1]
Automotive Windshield Washer Fluid (Type A)	all	25	0.31
Bathroom and Tile Cleaner	non-aerosol	1	0.13
Brake Cleaner	all	10	3.70
Carburetor or Fuel-Injection Air Intake Cleaner	all	10	2.00
Construction, Panel and Floor Covering Adhesive	non-aerosol	7	0.41
Disinfectant	aerosol	70	0.66
Disinfectant	non-aerosol	1	0.49
Engine Degreaser	aerosol	10	0.62
Floor Polish or Wax (for resilient flooring material)[2]	all	1	0.43
Floor Polish or Wax (for nonresilient flooring material)[2]	all	1	0.05
Furniture Maintenance Product	non-aerosol	3	0.06
General Purpose Cleaner	aerosol	8	0.05
General Purpose Degreaser	aerosol	10	0.70
Laundry Starch/Sizing/Fabric Finish Product	all	4.5	0.06
Oven Cleaner	non-aerosol	1	0.09
Sanitizer	aerosol	70	0.46
Sanitizer	non-aerosol	1	0.33
Temporary Hair Color[2]	aerosol	55	0.13
SUBTOTAL REDUCTIONS (TPD) Based on 2003 Survey Year Calculated for ABOVE CATEGORIES			10.68
Electronic Cleaner	all	(new exclusion; no change to limit)	-0.13[3] (to be mitigated)
Fabric Protectant	all	(no change)	--
Multi-Purpose Solvent	all	none	--
Nail Polish Remover	all	1 (previously 0)	-0.04[3] (to be mitigated)
Paint Thinner	all	none	--
Rubber/Vinyl Protectant	all	(no change)	--
TOTAL REDUCTIONS (tpd) Based on 2003 Survey Year Calculated for ALL CATEGORIES			10.51
TOTAL REDUCTIONS (tpd) 2008[2]			10.55
TOTAL REDUCTIONS (tpd) 2010[2]			11.46

1. Survey emissions adjusted for market coverage as discussed in Technical Support Document, Chapter IV.
2. Effective date 12-31-2010 for two categories (for three subcategories). [Effective date 12-31-2008 for all other categories]
3. Negative values indicate an emissions increase.

Other Proposed Amendments

a. Multi-Function Products

To address confusion and inequity in categorizing multi-function products, we are proposing modifications to the current definitions of "Multi-Purpose Solvent" and "Paint Thinner." Many products with multiple contaminant removal claims or with no claim on the product label have been classified as either "Multi-Purpose Solvent" or "Paint Thinner." This situation has created an unfair market advantage for the multi-function products over the single-claim products that are regulated by specific VOC limits. The proposal would require that products with multiple claims be subject to the VOC limits applicable to each of the claims. The net result of this action is that the most restrictive VOC limit would apply to the product. For the March 2007 Amendments, staff will evaluate setting an emissions standards for Multi-Purpose Solvents.

b. Consumer Products Regulation/Aerosol Coatings Regulation Overlap

To address confusion and inequity with certain aerosol products, we are proposing modifications to the current definitions of "Rubber and Vinyl Protectant" and "Fabric Protectant" in the Consumer Products Regulation, and modifications to "Exemptions" in the Aerosol Coatings Regulation. The overlap products are proposed to be regulated solely within the Consumer Products Regulation or the Aerosol Coatings Regulation. To accomplish this, products that meet either the proposed "Rubber/Vinyl Protectant" definition or the proposed "Fabric Protectant" definition in the Consumer Products Regulation would be regulated as such, and would be explicitly excluded from the "Aerosol Coatings Regulation." In addition, to clarify that cosmetics and other products used on the human body are also regulated solely within the Consumer Products Regulation, those products would also be explicitly excluded from the "Aerosol Coatings Regulation."

We are also clarifying that the current "Rubber and Vinyl Protectant" category, to be changed to "Rubber/Vinyl Protectant," includes products used for any combination of the substrates: rubber or vinyl.

c. Electronic Cleaners

In the 2004 Amendments to Consumer Products Regulations, the Board approved a VOC limit of 75 percent by weight for "Electronic Cleaners." At the time the limit was approved, the staff determined that the limit was commercially and technologically feasible. As is routinely done before limits become effective, staff consults with stakeholders to ensure that the limits are technologically feasible. In 2005, several manufacturers indicated that they were encountering problems reformulating certain "Electronic Cleaners" to meet the 75 percent limit. These niche products are those that are used in manufacturing settings where products must be non-flammable, electrically non-conductive, have high dielectric strength, and have a high degree of solvency (Kauri-butanol, or Kb values of 45-55). The Kb value is a measure of a compound's ability as a solvent. These attributes would be needed for

heavy duty cleaning of electronic components on a manufacturing line. Industry representatives also indicated that low-toxicity was important in this segment of the market.

Therefore, staff is proposing to exempt products from the definition, and the 75 percent VOC limit. The label for these certain electronic cleaner products must clearly display the statement: "not for retail sale" and must be sold exclusively to establishments which manufacture or construct goods or commodities. This proposal should ensure that the full range of electronic cleaning products continue to be available to the California market. However, staff will continue to evaluate the need for the exemption as additional technology becomes available. Staff has also determined that approximately 31 of the 106 "Electronic Cleaners" reported in the 2003 Survey would meet the proposed exemption. This reduces the emission reductions claimed from the category in the 2004 Amendments by 0.13 tpd. This small shortfall will be offset by the emission reductions achieved through this rulemaking.

d. Use of Toxic Air Contaminants

We are proposing to prohibit the use of methylene chloride, perchloroethylene and trichloroethylene in Construction, Panel, and Floor Covering Adhesive, Oven Cleaner, General Purpose Cleaner, and Bathroom and Tile Cleaner. The 2003 Survey found a construction, panel and floor covering adhesive product containing methylene chloride; it is our understanding the product has been discontinued. In addition, an oven and grill cleaning product, closely related to, but not included in the oven cleaner category, was found to also contain methylene chloride. It is also possible that chlorinated solvents could be included in reformulated General Purpose Cleaners and Bathroom and Tile Cleaners.

Under the California Environmental Quality Act, ARB is required to identify and mitigate any possible adverse environmental impacts of regulatory actions. We believe that it is unlikely, but possible, that manufacturers may, in response to new VOC limits, choose to reformulate with chlorinated solvents in the categories noted above. Therefore, because there are many products that comply with the proposed limits, none of which contain chlorinated solvents, we believe it appropriate to prohibit the use of these three solvents.

e. Nail Polish Remover

We are proposing to adjust the current zero percent VOC limit for "Nail Polish Removers" to 1 percent VOC. This change is necessary to address the technical reformulation issues identified for compliance with the zero percent VOC limit. The issues include the fact that VOCs are created by chemical reactions that occur in the product container even after the inclusion of high grade ingredients (which contain low levels of VOC contaminants) and reaction inhibitors in the formulation. This proposal will create a shortfall of approximately 0.04 tpd VOC, which will be mitigated by the

reductions resulting from the adoption of new VOC limits. The VOC emission reductions presented in this Executive Summary have been adjusted to account for the necessary action.

f. Other Minor Changes

Several other minor changes are being proposed that would not substantially affect parties subject to the Regulations, but serve to simplify, clarify, or better organize the Regulations.

7. Will the proposed amendments address the pending petition for the exemption of *tertiary*-Butyl acetate from the VOC definition?

No, staff is not proposing to exempt *tertiary* butyl acetate (TBAC) from the definition of VOC contained in section 94508(a) at this time. The exemption could provide an air quality benefit by reducing ground level ozone concentrations when TBAC is used as a replacement for other higher reactive VOC solvents. However, we have identified possible significant adverse environmental impacts that would result from the exemption, namely an increase in cancer risk. Once inhaled, TBAC metabolizes to form *tertiary* butyl alcohol, a potential carcinogen. Because of this possible impact, staff will continue to evaluate exposure scenarios for typical use patterns in various product categories. Staff will consider whether an exemption of TBAC form the definition of VOC and/or a limitation or prohibition of its use in consumer products is appropriate in the 2007 Amendments.

8. Who would be affected by these proposed amendments?

The proposed 2006 Amendments would apply to anyone who sells, supplies, offers for sale, or manufactures consumer products for use in California that are subject to the proposed amendments. The primary impact would be on manufacturers and marketers of consumer products. These businesses will have to reformulate some of their products. There may also be an impact on distributors and retailers, who must ensure that they are selling or supplying complying products. In addition, since some products will have to be reformulated, suppliers of chemicals, propellants, containers, valves, and other components may be impacted, depending on whether there is an increased or decreased demand for their products. Finally, consumers may have to pay more for some consumer products, or may have to make some adjustments to their use of reformulated products.

9. Will the provisions in the existing Consumer Products Regulation apply to the product categories covered in this rulemaking?

The existing provisions in the Consumer Products Regulation (such as the low vapor pressure VOC exemption, innovative products provision, and variance provision) will apply to the categories proposed for regulation.

10. Will the Alternative Control Plan (ACP) be available to the proposed product categories?

Yes. The ACP will allow manufacturers to submit plans to "average" the emissions from any combination of consumer products subject to the VOC limits in section 94509 of the Consumer Products Regulation, including the proposed new product categories. However, manufacturers cannot submit plans which include both consumer products subject to section 94511 "Innovative Products Provision," or aerosol coating products (aerosol paints) subject to section 94522.

D. REGULATORY DEVELOPMENT PROCESS AND EVALUATION OF ALTERNATIVES

1. How did ARB staff develop the Proposed 2006 Amendments?

In 2004, a subcommittee of the Consumer Products Working Group, the Consumer Products Regulation Workgroup (CPRWG), was formed to serve as a forum for communication during the 2003 Consumer and Commercial Products Survey (2003 Survey) and 2006 Amendments development process. Participation was open to any member of the public.

ARB staff began to develop the 2006 Amendments with the 2003 Survey, a comprehensive survey of select categories of consumer products. Numerous meetings were held with the CPRWG while developing the 2003 Survey.

This survey collected sales and formulation information on approximately 250 different consumer product categories and provided ARB staff with technical information used to develop the proposed 2006 Amendments. Four public meetings of the CPRWG and one Public Workshop were conducted from January 2006 through September 2006 while developing the 2006 Amendments. A chronology of the meetings and public workshop held is shown in Table 5.

To solicit additional information and comments, staff held or participated in numerous individual meetings, and teleconferences with industry representatives. Staff also analyzed survey data, performed shelf surveys, and researched technical literature, patents, and trade journals during the development of the proposed amendments.

Table 5
Chronology of Public Meetings and Workshop

Date	Meeting	Location
January 19, 2006	1st Workgroup Meeting for the CPRWG	Sacramento, CA with teleconference available
March 27, 2006	2nd Workgroup Meeting for the CPRWG	Sacramento, CA with teleconference available
June 1, 2006	3rd Workgroup Meeting for the CPRWG	Sacramento, CA with teleconference available
July 25, 2006	4th Workgroup Meeting for the CPRWG	Sacramento, CA with teleconference available
September 14, 2006	1st Public Workshop	Sacramento, CA with teleconference available

2. Who has actively participated in the process?

Consumer product manufacturers, chemical producers, and marketers, and their trade associations, have been the most active in the process. The trade associations include the following:

- Adhesives and Sealants Council
- American Beauty Association
- American Chemistry Council
- Automotive Aftermarket Industry Association
- Automotive Specialty Products Association
- California Fire Chief Association
- California Grocers Association
- California League of Food Processors
- Consumer Specialty Products Association
- Cosmetic, Toiletry, and Fragrance Association
- Fire District Association of California
- Fragrance Materials Association
- International Sanitary Supply Association
- Motor & Equipment Manufacturers Association
- National Aerosol Association
- National Paint and Coatings Association
- Soap and Detergent Association
- Western Aerosol Information Bureau

In addition, representatives from local air districts and agencies, including the South Coast Air Quality Management District and U.S. EPA, as well as many other individual consumer product manufacturers were involved in the process.

ARB staff maintains a mailing list of over 4,000 companies and interested parties, including environmental organizations, which received information throughout the development of the proposed amendments. In addition, we have established an electronic list serve to allow subscribers to receive pertinent information with over 1,300 subscribers.

3. How did ARB staff evaluate alternatives and choose the product categories proposed for regulation?

ARB staff began the selection process by reviewing all the consumer product categories included in the 2003 Survey, including both unregulated categories and previously regulated categories. Staff then eliminated from consideration: (1) categories where very little or no potential for emission reductions existed, (2) categories where adequate data were not obtained for pursuing emission reductions, and (3) categories where the technical justification for setting new VOC limits could not be completed in the required timeframe. Fifteen of the remaining categories are proposed for regulation at this time, with over 30 other categories deferred to the 2007 rulemaking.

At the second, third, and fourth public workgroup meetings, staff presented regulatory proposals for discussion. After each workgroup meeting, staff modified the proposals, as appropriate, based on the comments and technical information received from industry and staff investigations. During this process, several categories were postponed for consideration for the reasons given above. As mentioned previously, the current proposal would affect 15 categories, including 3 new categories, for which new product category definitions and VOC limits are proposed.

4. How were the proposed VOC limits in the proposed 2006 Amendments established?

The proposed VOC limits are the product of extensive research and analysis of data by staff and interaction with the affected consumer products industry, as discussed in the response to question number three. Although the proposed limits were based on factors unique to each individual category, the following general guiding principles were applied:

- technological and commercial feasibility - assuring that reformulation technologies will be available by the effective date for each proposed limit and that the basic consumer market demand can be met on that date;

- emission reductions achieved - assuring that our overall proposal will achieve the maximum feasible reduction as required by State law;

- preservation of product forms - assuring that each existing product form (e.g. liquid, semi-solid, solid, aerosol) is able to reformulate to meet the proposed VOC limit; and,

- minimize potential for use of Toxic Air Contaminants - assuring that the proposed limit can be met with formulations that do not rely on the increased use of Toxic Air Contaminants.

E. COMPLIANCE WITH THE PROPOSED 2006 AMENDMENTS

1. How will manufacturers comply with the proposed 2006 Amendments?

Manufacturers of non-complying products will need to reformulate their products to meet the applicable VOC limits. Manufacturers have the flexibility to choose any formulation that meets the applicable VOC limits and the reformulation options vary with each product category (see Chapter VI of the Technical Support Document). In general, VOC solvents or propellants will need to be replaced, or partially replaced, with non-VOC ingredients. This may require switching to a water-based formulation, using acetone or another exempt solvent, increasing product solids, or formulating with a non-VOC propellant. Manufacturers may also need to change the valve, container, delivery system, or the other components of the consumer product depending on the individual formulation. ARB staff has proposed VOC limits that can be met without the increased use of Toxic Air Contaminants.

2. Are there alternative compliance options to the proposed VOC limits?

Yes. Manufacturers can comply with the proposed amendments through the use of the Innovative Products Provision (IPP), or the Alternative Control Plan (ACP). The IPP allows manufacturers of "innovative products" to comply with the Consumer Products Regulation if they demonstrate through clear and convincing evidence that their product will result in less VOC emissions than a complying product that meets the applicable VOC limit. The innovative product may result in less emissions due to some characteristic of the product formulation, design, delivery system, or other factors.

The ACP allows manufacturers to average the emissions from products above and below the applicable VOC limits, as long as the overall emissions are less than or equal to the emissions that would have occurred had all the products complied with the VOC limits. Manufacturers must submit an application which includes the VOC content of the products in the plan, a method of verifying the sales of each product in the plan, and other information necessary to track overall emissions.

3. Are the VOC limits for the proposed amendments technologically and commercially feasible?

As explained in detail in Chapters III and VI of the Technical Support Document, all the VOC limits proposed are technologically and commercially feasible. The proposed limits were targeted towards the lowest VOC content technology within a

product category which would adequately perform the intended function. In doing this, we ensured that the various product forms within each category would be preserved, and the proposed limits could be met without the use of Toxic Air Contaminants. ARB staff will track manufacturers' progress in meeting the proposed VOC limits, as we have done in past regulatory efforts for consumer products. If manufacturers encounter unanticipated but insurmountable difficulties, we will consider proposing amendments to the Consumer Products Regulations to address them.

As shown in Table 6, our survey results demonstrate that products are available that comply with the proposed limits for most of the product categories. The complying market shares listed in Table 6 vary widely with each category (as in previous regulations) because the proposed limits were developed after considering a variety of factors unique to each category. These factors include the availability of reformulation options that may not be used in current products, the variety of product types in a given category, patents that may restrict some reformulation options, and economic issues.

To allow time for reformulation in all categories, the VOC limits become effective on December 31, 2008 (and on December 31, 2010 for two categories). In addition, staff will also perform a technical assessment of manufacturers' progress in meeting the proposed VOC limits.

F. ECONOMIC IMPACTS

1. Will the proposed amendments be cost-effective?

Cost-effectiveness is one measure of a regulation's efficiency in reducing a given amount of pollutant (often reported in "dollars spent per pound of pollutant reduced"). The determination of cost-effectiveness is well-established and often used to compare a proposed regulation's cost-efficiency with those of other regulations. To determine the cost-effectiveness of the proposed regulations, we relied on specific formulation data from the 2003 Survey, industry journals/literature such as the Chemical Market Reporter for ingredient unit prices, discussions with industry representatives, and the cost analyses conducted for the existing ARB consumer products program. Based on our analyses, we estimate the cost-effectiveness of the proposed VOC limits is about $2.35 per pound of VOC reduced. This estimated cost-effectiveness value is consistent with existing ARB regulations and control measures. For example, the cost-effectiveness of the 2004 Consumer Products Regulation Amendments was $2.40. For the 1997 Hairspray Regulation and the 1995 Aerosol Coating Products Regulation the cost-effectiveness was about $2.25 and $3.00 per pound of VOC reduced, respectively. Further, the cost-effectiveness of the recent Inboard Marine and Transit Bus Measures were each determined to be approximately $2.00 per pound of ozone precursor reduced.

We estimate that the total cost incurred by industry to comply with this regulation is about $20 million per year. These cost estimates are based on assumptions specific to each category depending on reformulation needs. For some categories it was

assumed that manufacturers would either drop certain products or undergo minor product formulation changes, and for other categories, manufacturers would undergo complete production line overhaul and equipment replacement rather than simple re-tooling.

Table 6
Summary of Complying Products

Product Category	Product Form	Proposed VOC Limit (wt%)	Number of Complying Products/ Total	Complying Market Share (%)
Automotive Windshield Washer Fluid (Type A)	all	25	12 / 38	17.0
Bathroom and Tile Cleaner	non-aerosol	1	264 / 337	80.9
Brake Cleaner	all	10	21 / 112	5.0
Carburetor or Fuel-Injection Air Intake Cleaner	all	10	2 / 110	3.3
Construction, Panel and Floor Covering Adhesive	non-aerosol	7	42 / 76	46.9
Disinfectant	aerosol	70	24 / 63	6.4
Disinfectant	non-aerosol	1	264 / 337	92.6
Engine Degreaser	aerosol	10	4 / 47	9.0
Floor Polish or Wax (for resilient flooring material)	all	1	150 / 340	66.8
Floor Polish or Wax (for nonresilient flooring material)	all	1	58 / 113	62.5
Furniture Maintenance Product	non-aerosol	3	46 / 76	46.2
General Purpose Cleaner	aerosol	8	40 / 142	11.5
General Purpose Degreaser	aerosol	10	21 / 103	3.1
Laundry Starch/Sizing/Fabric Finish Product	aerosol	4.5	2 / 14	0.6
Laundry Starch/Sizing/Fabric Finish Product	non-aerosol	4.5	34 / 34	100**
Oven Cleaner	non-aerosol	1	50 / 100	25.6
Sanitizer	aerosol	70	0 / 7	0
Sanitizer	non-aerosol	1	123 / 139	92.5
Temporary Hair Color	aerosol	55	1 / 30	***

Source: 2003 Consumer and Commercial Products Survey (ARB, 2003).
**All non-aerosol products very low VOC; already comply; not affected by rulemaking.
***Omitted to protect confidentiality.

2. Will consumers have to pay more for consumer products subject to the 2006 Amendments?

Consumers may have to pay more for some products subject to the proposed amendments, depending on the extent to which manufacturers are able to pass along their costs to consumers. As explained in Chapter VII of the Technical Support Document, the average increase in cost per unit to the manufacturer is estimated to be about $0.06. These estimated cost per unit values are consistent with existing ARB regulations and control measures. For example, for the 1989 Antiperspirants and Deodorants Regulation, the 1995 Aerosol Coatings Products Regulation, and the 2004 Consumer Products Regulation Amendments, the increased cost to manufacturers were about $0.25, $0.30, and $0.16 respectively.

3. What are the expected economic impacts of the proposed regulation on businesses?

In our economic impacts analysis, we evaluated the proposed VOC limits for potential impacts on profitability and other aspects of businesses subject to the limits (with particular attention to California businesses), the cost-effectiveness of the limits, and the estimated cost impacts to consumers. To conduct our analysis, we relied on a combination of publicly available financial databases ("Dun and Bradstreet," "Ward's Business Directory of U.S. Manufacturing Industries," etc.), the ARB's 2003 Consumer and Commercial Products Survey, industry journals/literature such as the "Chemical Market Reporter," discussions with industry representatives, and the cost analyses conducted for the existing ARB consumer products program.

Based on our analysis, we expect most manufacturers to be able to absorb the added costs of the proposed regulation without an adverse impact on their profitability. In addition, as explained in more detail below, we found that the proposed amendments are cost-effective relative to similar ARB regulations or measures, and the impacts to consumers are consistent with existing ARB regulations.

We estimated the change in "return-on-owners equity" (ROE) as an indicator of the limits' potential impacts on business profitability. The cost to comply with the proposed regulation, through increased research and development, equipment purchase and other investment costs, is presumed to impact a business' ROE and therefore its profitability. The cost to reformulate non-complying products for a typical company was used to determine total annual reformulation costs. Our analysis indicates the estimated change in ROE can vary from essentially no change to 4.9 percent change. The average change in ROE is about 3.4 percent, relative to the ROE before the proposed amendments would take effect. This estimated change in ROE is well within the change in ROE estimated for ARB's existing consumer products and motor vehicle programs.

Our ROE analysis for the proposed limits may overestimate the impact on business because it assumes that all of the costs of the proposed limits will be absorbed

by manufacturers. In reality, we expect that at least some of the investment costs to comply with the proposed limits will be passed on to consumers. The analysis presumes that some cost mitigation will occur due to "technology-transfer" between product lines and from third-party manufacturers (i.e., contract fillers) who fill essentially equivalent products for a number of competing businesses.

While we expect that most businesses will be able to absorb the costs of the proposed amendments without significant adverse impacts on their profitability, there is the possibility that some individual businesses will be adversely affected by this regulatory action. Therefore, it is possible that the proposed amendments may have a significant adverse impact on some businesses that are not in a market position to invest monies to develop new low VOC products, or to absorb the increased cost resulting from their compliance with the proposed regulation.

Based on our analysis, we do not expect the proposed amendments to have a significant impact on employment, or business creation, elimination, or expansion. We also do not expect the regulation to have a significant impact on the competitiveness of California businesses compared with those outside of California. This is because all companies that sell these products in California would have to meet the proposed requirements, whether located in California or outside of California.

The VOC limits in the proposed amendments will primarily impact consumer product manufacturers and marketers (companies which contract out the manufacturing of their products). However, we recognize that other industries could also be impacted to a lesser amount, which is difficult to quantify. These industries include distributors, retailers, and "upstream" suppliers who supply containers, valves, solvents, propellants, and other chemicals used in consumer products.

Distributors and retailers could be impacted if some manufacturers decide to carry a dual inventory of products (one for California and one for the rest of the nation). However, most manufacturers have indicated that they will not manufacture California and 49-state products because dual-distribution systems are expensive to establish and maintain. Another potential cost to distributors or retailers would be the implementation of procedures to ensure that non-complying products are not sold past the three year "sell-through period." However, based on retail sell-through data obtained during the development of ARB's existing consumer products regulations, we believe the existing three year sell-through period should provide ample time to allow for the sale of non-complying products.

Upstream suppliers could be impacted because manufacturers will be purchasing some different solvents, propellants, and other materials for their reformulated products. They may also purchase different containers, valves, or other components for their reformulated products. However, we do not expect these changes to result in a major impact on the affected industries because chemical companies generally supply many different industries, and because many of the upstream suppliers also provide the alternative products which will be used in the reformulated products. In fact, we expect

some upstream suppliers will benefit since the proposed limits are likely to create new or increased demand for materials to be used in compliant formulations.

G. ENVIRONMENTAL IMPACTS

1. What are the expected environmental benefits of reducing VOCs in the 2006 Amendments?

One of the environmental benefits of the 2006 Amendments will be a reduction in the formation of ground level ozone because the proposed VOC limits result in reductions of ozone precursors (VOC) of 10.6 tpd statewide by December 31, 2008, and 11.5 tpd by December 31, 2010, based on the 2003 Survey results. We also expect no adverse impact and most likely a positive impact on secondary organic aerosol formation. VOCs are a source of particulate matter (PM), namely secondary organic aerosols, either through condensation of the VOCs or complex reactions of VOCs with other compounds in the atmosphere. In general, depending on reformulation options chosen, secondary organic aerosols will be reduced.

2. Will Toxic Air Contaminants be reduced?

The proposed VOC limits for Brake Cleaners, Carburetor and Fuel Injection Air Intake Cleaners, Engine Degreasers, General Purpose Degreasers, and Construction, Panel, and Floor Covering Adhesives may reduce emissions of hexanes. For the other categories for which we have proposed VOC limits, we have determined that there are currently no emissions of methylene chloride, perchloroethylene, or trichloroethylene. However, we have determined that it is possible that manufacturers could choose to reformulate with these compounds in Construction, Panel, and Floor Covering Adhesive, Oven Cleaner, Bathroom and Tile Cleaner, and General Purpose Cleaner in response to new VOC limits. Therefore as a mitigation measure, we propose to prohibit their use thus preventing a possible increased use.

3. How would the 2006 Amendments proposal reduce the risk to public health by reducing VOCs?

While we cannot accurately assess potential risk reduction due to reducing VOC and PM emissions, it has long been known that exposure to ground level ozone and PM have adverse impacts on public health. Research has shown that, when inhaled, ozone and PM can cause respiratory problems, aggravate asthma, impair the immune system, and cause increased risk of premature death. Any reduction in PM or ozone precursors, namely VOCs, results in improving health in California.

4. Are there any potential negative environmental impacts?

We examined the potential effect of the proposed regulation on global warming, stratospheric ozone depletion, the use of TACs, and the impacts on water quality and solid waste disposal. Based on our analysis, as detailed in Chapter VIII of the Technical

Support Document, we do not expect any significant adverse environmental impacts to result from the proposed 2006 Amendments. Staff does acknowledge a slight erosion of VOC emissions reductions due to the shortfall from the adjustment for "Nail Polish Remover" and the new exclusion in "Electronic Cleaner." This shortfall will be mitigated by reductions of nearly 12 tpd from the new VOC limits. Based on the analysis presented in Chapter VIII. Environmental Impacts, the proposed action will lead to reductions in emissions of VOC with the potential (depending upon the alternative used) for a small change in the emissions of global warming pollutants. Staff believes that the potential increase in global warming pollutant emissions are tempered by the agency's need to be mindful of health protection via reduction of ozone precursors.

5. How does the proposal relate to ARB's goals on environmental justice?

This proposal is consistent with the ARB's Environmental Justice Policy to reduce health risks in all communities, including low-income and minority communities. Generally, use of consumer products is fairly uniform across the State, tracking with population, and their emissions are spread over the course of a day, rather than concentrated at a particular time of day. For these reasons, we do not believe that people of any given race, culture, or income would be more impacted than any others would. All Californians should benefit equally from the reduction in VOC emissions from the consumer product categories proposed for regulation, as well as from the prohibition on use of chlorinated solvents that are TACs in the categories containing them.

H. FUTURE PLANS

We are currently developing a subsequent proposal for Board consideration in March 2007 (the "2007 Amendments") for other consumer product categories that were deferred. Other proposed changes will be included to clarify and strengthen the Consumer Products Regulation. The subsequent proposal is scheduled to allow more time for interested stakeholders, as they had requested, to evaluate the various ARB staff proposals deferred to 2007.

During 2007, staff will also begin a new regulatory cycle with the preparation of the Consumer and Commercial Products Survey package for the 2006 sales year (2006 Survey) to be distributed to industry. The 2006 Survey will be comprehensive in nature and the data collected will be used as the basis for rulemakings in 2008 for implementation in 2010. These rulemakings, along with the previously adopted CONS-1 and CONS-2 measures, are intended to fulfill the ARB commitment in the 2003 SIP pertaining to consumer products.

In 2007, 15 California areas are required to show how they will meet the federal eight-hour ambient air quality standard for ozone. ARB expects that manufacturers and marketers of consumer products will need to reduce emissions beyond the existing 2003 SIP targets for to meet both the State Ozone Standards and the federal eight-hour standard. We will be developing new control measures for consumer products, to be

included in the 2007 SIP submittal to U.S. EPA. (See Chapter IX of the Technical Support Document, "Future Activities").

For each of these future activities staff will consult with interested parties through the same workgroup process (see Chapter II of the Technical Support Document) used to develop the 2006 Amendments.

I. RECOMMENDATION

We recommend that the Board adopt the proposed 2006 Amendments to the Consumer Products and Aerosol Coatings Regulations.

REFERENCES

1. Air Resources Board. Proposed 2003 State and Federal Strategy for the California State Implementation Plan. August 25, 2003. http://www.arb.ca.gov/planning/sip/stfed03/stfed03.htm. (ARB, 2003)

2. Air Resources Board. Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for Para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products. May 7, 2004. (ARB, 2004)

3. Air Resources Board. Definitions of VOC and ROG - Last Revised September 2004. http://www.arb.ca.gov/ei/speciate/ROG_DFN_9_04.pdf. (ARB, 2006a)

4. Air Resources Board. Consumer Products Emissions by Category, and Speciation Profile Assignment -- 1998 CEIDARS Emission Inventory. 12-05-00 Draft Table 1. http://www.arb.ca.gov/ei/speciate/CPAERAIMems_web.pdf. (ARB, 2006b)

5. Air Resources Board. The California Almanac of Emissions and Air Quality – 2006 Edition. 2006 (ARB 2006 Almanac)

6. United States Environmental Protection Agency. National Ambient Air Quality Standards for Particulate Matter. September 21, 2006. (U.S. EPA, 2006)

APPENDIX A:
Technical Support Document

I.

INTRODUCTION

A. OVERVIEW

This Technical Support Document presents our technical justification and analysis of the proposed amendments. It is part of the Initial Statement of Reasons (ISOR) for Proposed Amendments to the California Consumer Products Regulation and the Aerosol Coatings Regulation. The proposed amendments to the Consumer Products and Aerosol Coatings Regulations (2006 Amendments) are intended to partially fulfill the first half of the CONS-2 commitment of the consumer products element in the Proposed 2003 State and Federal Strategy for the California State Implementation Plan (Statewide Strategy, 2003, or SIP), and fulfill the requirements of a SIP lawsuit settlement agreement reached with environmental groups. The proposed 2006 Amendments can be found in Appendix B of this document.

Included in this technical support document is the following information:

- a discussion of the process used to develop the proposed amendments;
- a discussion of the technical basis for the proposed amendments;
- a review of the emissions from the proposed categories for regulation and the overall need for the emission reductions;
- a description of the proposed amendments and the consumer product categories proposed for regulation;
- an analysis of the environmental and expected economic impacts from the proposed amendments; and
- a discussion of future activities.

B. ENABLING LEGISLATION

In 1988, the California Clean Air Act (CCAA or "the Act") became law to address the State's serious air pollution problems and the inability of many areas in California to attain the State and federal ambient air quality standards. The CCAA added section 41712 to the California Health and Safety Code (HSC). This section, along with subsequent amendments, requires the Air Resources Board (ARB or Board) to adopt regulations to achieve the maximum feasible reduction in volatile organic compound (VOC) emissions from consumer products. Prior to adoption, the Board must determine that adequate data exist to establish both of the following:

- the regulations are necessary to attain State and federal ambient air quality standards; and

- the regulations are commercially and technologically feasible.

The Act further stipulates that regulations adopted must not eliminate any product form, and that recommendations from health professionals must be considered when developing VOC control measures for health benefit products. In enacting section 41712, the Legislature gave the ARB authority to control emissions from a very diverse number of products sold statewide to household and commercial consumers.

C. BACKGROUND

1. Existing Consumer Product Regulations

To date, the Board has taken several actions to fulfill the legislative mandate pertaining to the regulation of consumer products including antiperspirants and deodorants and aerosol coating products. Three regulations have been adopted setting limits for a total of 112 consumer product categories with 145 VOC limits and 36 categories of aerosol coatings. In addition, two voluntary regulations, the Alternative Control Plan and the Hairspray Credit Program have been adopted to provide compliance flexibility to companies. These five regulations are found in Title 17, California Code of Regulations, sections 94500 to 94575:

- Antiperspirants and Deodorants (Article 1, sections 94500-94506.5);

- Consumer Products (Article 2, sections 94507-94517);

- Aerosol Coating Products (Article 3, sections 94700-94701);

- Alternative Control Plan (Article 4, sections 94540-94555); and

- Hairspray Credit Program (Article 5, sections 94560-94575).

ARB staff developed, and the Board approved, the Consumer Products Regulation in three phases. Phase I was approved in 1990, Phase II was approved in 1997, and Phase III (also known as Midterm Measures I and II) was approved in two regulatory actions in 1997 and 1999. In addition, a fourth "phase" was initiated with the 2004 Amendments and will continue with this rulemaking and subsequent rulemakings in 2007 and 2008. A complete summary of consumer products program regulatory actions with dates of regulatory amendments are provided in Appendix E.

2. Consumer Products and the State Implementation Plan (SIP)

State Implementation Plans

Federal clean air laws require areas with unhealthy levels of ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide and inhalable particulate matter to develop SIPs describing how they will attain national ambient air quality standards (NAAQS). The 1990 amendments to the federal Clean Air Act set new deadlines for attainment based on the severity of the pollution problem and launched a comprehensive planning process for attaining the NAAQS. The promulgation in 1997 of the new national eight-hour ozone standard and the fine particulate matter ($PM_{2.5}$) standards and designation in 2004 of nonattainment areas will result in additional statewide air quality planning efforts. In response to new federal regulations, future SIPs will also address ways to improve visibility in national parks and wilderness areas.

A SIP is a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, and State and federal regulations. Many of California's strategies apply statewide, including emission standards for cars and heavy-duty trucks, fuel regulations, and limits on emissions from consumer products. State law makes ARB the lead agency for all purposes related to the SIP. Local air districts and other agencies, such as the Department of Pesticide Regulation, prepare SIP elements and submit them to ARB for review and approval. ARB forwards SIP revisions to the United States Environmental Protection Agency (U.S. EPA) for approval and publication in the Federal Register. The Code of Federal Regulations Title 40, Chapter I, Part 52, Subpart F, Section 52.220 lists all of the items which are included in the California SIP. Some California submittals are pending U.S. EPA approval.

1994 California State Implementation Plan for Ozone

On November 15, 1994, the ARB adopted the California State Implementation Plan for Ozone (1994 SIP). Achieving significant VOC reductions from consumer products is a key element of the 1994 SIP. The consumer products element of the 1994 SIP is comprised of Near-term, Mid-term, and Long-term measures. The Near-term measures are comprised of the Phase I and II consumer products regulations (and other ARB regulations related to consumer products). The Mid-term measures commitment was partially fulfilled by the Phase III amendments to the Consumer Products Regulation. Consumer products rulemaking actions to date are summarized in Appendix E: Summary of Regulations Adopted and Dates of Regulatory Amendments.

2003 State and Federal Strategy and 2003 South Coast SIP

On October 23, 2003, the ARB adopted the 2003 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. The Statewide Strategy identifies the Board's near-term regulatory agenda to reduce ozone and particulate matter by establishing enforceable targets to develop and adopt new measures for each year from 2003 to 2008, including commitments for the Board to consider 19 specific measures. In addition, it 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 and San Joaquin Valley. It also describes feasible approaches to reduce emissions from sources under the jurisdiction of the federal government.

ARB's commitments have been incorporated into the revised SIPs for the South Coast and San Joaquin Valley, and will be included as needed in SIP revisions for other parts of California expected over the next several years. Additional emission reductions are needed in both areas to meet the existing federal air quality standards. In addition to meeting federal requirements, this Strategy ensures continued progress towards California's own health-based standards.

The South Coast Air Quality Management District adopted the 2003 Air Quality Management Plan on August 1, 2003. The ARB approved the local SIP element and the State and federal strategy on October 23, 2003, and on January 9, 2004, the ARB submitted to the United States Environmental Protection Agency (U.S. EPA) both the Statewide Strategy and the 2003 South Coast SIP as revisions to the California SIP. Thus, the elements of 2003 Statewide Strategy became part of the California SIP submittal package. Further, the emissions benefits of the statewide measures identified would then be realized not only in the South Coast Air Basin, but statewide. The San Joaquin Valley Unified Air Pollution Control District adopted the 2004 State Implementation Plan for Ozone in the San Joaquin Valley on October 8, 2004. The ARB approved the 2004 San Joaquin Valley SIP on October 28, 2004, and submitted it to the U.S. EPA for federal approval on November 15, 2004, as a revision to the California SIP. The 2003 SIP updates all elements of the approved 1994 SIP and includes additional consumer products measures.

Together with significant reductions from stationary industrial facilities, mobile sources, and other area-wide sources such as architectural coatings and petroleum marketing, the reductions in the consumer products element of the SIP are an essential part of California's effort to attain the air quality standards. The following two measures from the Statewide Strategy and the 2003 South Coast SIP were intended to reduce emissions from consumer products:

- **Measure CONS-1: Set New Consumer Products Limits for 2006.** In the 2003 Statewide Strategy, ARB committed to present a measure to the Board by 2004 (2004 Amendments). The measure would achieve VOC emission reductions from consumer products of at least 2.3 tons per day (tpd) in the South Coast Air Basin in 2010. Statewide, this measure would achieve 5.3 tpd in emission reductions by 2010. The ARB has fulfilled this commitment. On June 26, 2004, the Board adopted a CONS-1 measure (the "2004 Amendments"), which will achieve 3.0 tpd in VOC emission reductions in the South Coast Air Basin by 2010, and achieve 6.9 tpd

in VOC emission reductions statewide by 2010. The adopted CONS-1 measure became legally effective on June 20, 2005, with implementation of the CONS-1 VOC limits beginning on December 31, 2006 (ARB, 2004).

- **Measure CONS-2: Set New Consumer Products Limits for 2008-2010.** The ARB also committed to present new consumer product category limits to the Board between 2006 and 2008 that would achieve VOC emission reductions from consumer products of between 8.5 tpd and 15 tpd in the South Coast Air Basin in 2010. Statewide, this measure would achieve 20-35 tpd in emission reductions by 2010.

  The current proposal is intended to partially fulfill ARB's commitment for CONS-2 to achieve 4.9 tpd in VOC emission reductions in the South Coast Air Basin by 2010, and achieve 11.5 tpd in VOC emission reductions statewide by 2010. We are developing a subsequent proposal for presentation to the Board in March 2007 (the "2007 Amendments"), to consider related proposals that have been deferred at the request of interested stakeholders to allow more time for review of technical issues.

  The remainder of the CONS-2 commitment is expected to be fulfilled with further rulemakings, beginning in 2007 with preparation of the 2006 sales year survey package (2006 survey) for distribution to industry. Rule adoption is scheduled for 2008, with rule implementation in 2010.

- **Further Reductions from Consumer Products.** In addition, it is expected that further emission reductions will be needed from all source categories, including consumer products, to meet the long-term emission reduction targets included in the South Coast SIP. As such, there is an ongoing commitment to pursue additional technologically and commercially feasible reductions in consumer product emissions.

Future State Implementation Plans

In July 1997, the U.S. EPA established a new federal eight-hour ozone standard and fine particulate matter ($PM_{2.5}$) standards (U.S. EPA, 1997a, 1997b). On April 15, 2004, U.S. EPA designated 15 areas of California nonattainment for the new eight-hour ozone standard effective June 15, 2004 (U.S. EPA, 2004a). Many, but not all of these areas were nonattainment for the federal one-hour standard. New nonattainment areas include a number of rural Sierra foothill counties and additional parts of the Sacramento Valley. The one-hour standard was 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 federal Clean Air Act requires that all emission reduction commitments and specific measures identified in the 2003 Statewide Strategy must be fulfilled, even though the 2003 SIP has not been "approved" by U.S. EPA. In addition,

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.

SIPs demonstrating attainment of the new federal ozone and particulate matter standards must be adopted by the local air districts and ARB. The ozone plans are due to the U.S. EPA by June 2007. U.S. EPA designated the South Coast and San Joaquin Valley as non-attainment areas for the federal $PM_{2.5}$ standard, effective April 5, 2005. $PM_{2.5}$ plans are due to the U.S. EPA by April 2008[1] (U.S. EPA, 2004b). In response to new federal regulations, future SIPs will also address ways to improve visibility in national parks and wilderness areas. See Chapter IX, Future Activities, for more details regarding local air districts required to prepare plans, related activities and schedule. Up-to-date information on SIP activities can be found on ARB's website at: http://www.arb.ca.gov/planning/sip/sip.htm.

The preliminary draft of the State Strategy for Meeting Federal Air Quality Standards is scheduled to be released in the fall of 2006, and staff is currently holding workshops and soliciting comments. This planning document will commit ARB to further control the sources under its jurisdiction to the extent necessary to meet the standards and protect public health. The emission reduction targets in the preliminary State Strategy are challenging – significant reductions are needed from every major source category in order to meet our air quality goals in the most polluted areas of the State. The consumer product category is a significant source of VOC emissions statewide. As indicated in Tables I-1 and I-2, next page, consumer products are among the top VOC sources in the South Coast Air Basin and San Joaquin Valley Air Basin. Consumer product emissions will be the single largest VOC source category, comprising 24.5%, in the South Coast Air Basin by 2020, overtaking light-duty passenger cars as the top source category (ARB 2006 Almanac). By 2020, consumer product emissions will be the third largest VOC source category, comprising 8.8%, in the San Joaquin Valley Air Basin. It is therefore expected that there will be a Consumer Products element of the future 2007 Ozone SIP which will set forth a specific commitment that further emission reductions from Consumer Products will be needed.

3. SIP Lawsuit Settlement Agreement

In 1997, three environmental groups (Communities for a Better Environment, the Coalition for Clean Air, and the Natural Resources Defense Council) filed a complaint in the United States District Court for the Central District of California. The lawsuit was filed against the ARB, the South Coast Air Quality Management District, and the U.S. EPA related to California's progress in achieving the 1994 SIP commitments. The ARB reached a settlement agreement with these groups in January 1999 (Settlement, 1999). The settlement agreement was amended twice, in December 1999 and in June 2003 (Settlement, 1999). Although the 2003 SIP revision is intended to replace

[1] On September 21, 2006, U.S. EPA announced a more stringent 24-hour PM standard. Final designations for the new standard are scheduled to be promulgated in 2009 (U.S. EPA, 2006).

Table I-1
Top Ten Emitting Categories in the South Coast Air Basin
In 2010 and 2020

2010 Ranking	2020 Ranking	Source Category	2010 ROG (tpd)	2010 % of Total	2020 ROG (tpd)	2020 % of Total
2	1	Consumer Products	112.0	19.8%	120.7	24.5%
1	2	Light Duty Passenger Cars	159.8	28.2%	86.8	17.6%
4	3	Coatings (Paints and Thinners - non architectural)	33.3	5.9%	38.0	7.7%
3	4	Off-Road Equipment (Lawn and Garden)	34.2	6.0%	31.1	6.3%
5	5	Architectural Coatings (Paints and Thinners)	25.5	4.5%	28.5	5.8%
7	6	Petroleum Marketing (Gasoline Evaporative Losses)	21.7	3.8%	23.2	4.7%
9	7	Degreasing	15.5	2.7%	17.5	3.6%
8	8	Heavy Duty Gas Trucks	19.3	3.4%	13.5	2.8%
6	9	Recreational Boats	21.8	3.8%	13.0	2.7%
12	10	Chemical (Process and Storage Losses)	10.0	1.8%	11.7	2.4%
10	11	Gas Cans	10.2	1.8%	10.8	2.2%
-	-	Other Sources	103.5	18.2%	97.4	19.7%
-	-	**Total**	**566.8**	**100%**	**492.2**	**100%**

Source: ARB 2006 Almanac

Table I-2
Top Ten Emitting Categories in the San Joaquin Valley Air Basin
In 2010 and 2020

2010 Ranking	2020 Ranking	Source Category	2010 ROG (tpd)	2010 % of Total	2020 ROG (tpd)	2020 % of Total
3	1	Livestock Waste (Dairy Cattle)	45.0	11.5%	59.8	15.7%
1	2	Prescribed Burning	48.1	12.4%	47.1	12.3%
4	3	Consumer Products	27.8	7.2%	33.4	8.8%
5	4	Oil and Gas Production (Evaporative Losses)	26.7	6.9%	23.8	6.2%
2	5	Light Duty Passenger Cars	45.0	11.6%	23.4	6.1%
6	6	Pesticides	22.6	5.8%	21.8	5.7%
7	7	Coatings (Paints and Thinners – Non Architectural)	13.8	3.5%	17.4	4.6%
9	8	Petroleum Marketing (Gasoline Evaporative Losses)	11.5	3.0%	13.2	3.5%
8	9	Food and Agriculture (Crop Processing and Wineries)	12.0	3.1%	13.1	3.4%
10	10	Architectural Coatings (Paints and Thinners)	9.8	2.5%	10.8	2.8%
-	-	Other Sources	127.0	32.8%	117.6	30.8%
-	-	**Total**	**389.4**	**100%**	**381.6**	**100%**

Source: ARB 2006 Almanac

the State's original commitments under the 1994 SIP for the South Coast, the settlement agreement will remain in place until the ARB fulfills its obligations under the agreement.

The agreement includes a list of measures to be considered by the ARB and a schedule. ARB staff committed to specific consumer products measures that are in the 2003 Strategy, CONS-1 and CONS-2 control measures. Included in the list of specific measures, the ARB staff committed to develop a measure by 2004 and implement by 2006, that would achieve VOC emission reductions from consumer products of at least 2.3 tpd in the South Coast Air Basin by 2010. Staff's proposal for the CONS-1 measure was approved by the Board on June 24, 2006 and fulfilled the 2.3 tpd emission reduction in the South Coast Air Basin. The amendments to the Consumer Products and Aerosol Coatings Regulations proposed in this report are intended to partially fulfill the 8.5 to 15 tpd emission reduction in the South Coast Air Basin and fulfills the remaining VOC reduction commitment in the lawsuit settlement agreement.

4. National Consumer Products Regulations

On September 11, 1998, the U.S. EPA promulgated a national consumer products regulation, the "National Volatile Organic Compound Emission Standards for Consumer Products (40 CFR Part 59, Subpart C, Sections 59.201 et seq.; see the September 11, 1998, Federal Register, Vol. 63, No. 176, pages 48819-48847)" (U.S. EPA, 1998). This action promulgates national VOC emission standards for 24 categories of consumer products. The rule became effective on September 11, 1998, and the VOC limits became effective on December 10, 1998. There are similarities and differences between the California and national consumer products regulations; however, the national rule does not preclude states from adopting more stringent regulations.

Although the national regulation is similar in many aspects to the California regulation, it is less effective in reducing VOC emissions from consumer products. The national regulation does not include ARB's more stringent second tier standards, mid-term measures categories, or aerosol coatings. The national regulation achieves a 20 percent reduction in VOC emissions while California's existing consumer products and aerosol coatings regulations have already achieved a 50 percent reduction in the regulated categories. Because California has unique air quality problems, we must reduce VOC emissions from all categories including consumer products to the maximum extent feasible to attain the federal and State ambient air quality standards for ozone.

REFERENCES

1. Air Resources Board. Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for Para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products. May 7, 2004. (ARB, 2004)

2. Air Resources Board. The California Almanac of Emissions and Air Quality – 2006 Edition. 2006. (ARB 2006 Almanac)

3. Proposed 2003 State and Federal Strategy for the California State Implementation Plan; released August 25, 2003; adopted by the Air Resources Board on October 23, 2003, available at http://www.arb.ca.gov/planning/sip/stfed03/stfed03.htm. (Statewide Strategy, 2003)

4. Settlement Agreement, with amendments, in *Coalition for Clean Air, Inc. et al. v. South Coast Air Quality Management District, et al.* (U.S. District Court, Central District of CA, Case No. CV-97-6916 JSL (SHx)), Final January 23, 1999; First Amendment to Settlement Agreement, December 9, 1999; Second Amendment, June 25, 2003. (Settlement, 1999)

5. South Coast Air Quality Management District Governing Board. 2003 South Coast Air Quality Management Plan, adopted on August 1, 2003, available at http://www.aqmd.gov/aqmp/AQMD03AQMP.htm. (SCAQMD, 2003)

6. United States Environmental Protection Agency. National Ambient Air Quality Standards for Ozone; Final Rule. Federal Register. July 18, 1997, Volume 62, Number 138, Page 38855-38896, available at http://www.epa.gov/fedrgstr/EPA-AIR/1997/July/Day-18/a18580.htm. (U.S. EPA, 1997a)

7. United States Environmental Protection Agency. National Ambient Air Quality Standards for Particulate Matter; Final Rule. Federal Register. July 18, 1997, Volume 62, Number 138, Page 38651-38701, available at http://www.epa.gov/fedrgstr/EPA-AIR/1997/July/Day-18/a18577a.htm. (U.S. EPA, 1997b)

8. United States Environmental Protection Agency. "National Volatile Organic Compound Emission Standards for Consumer Products (40 CFR Part 59, Subpart C, Sections 59.201 et seq.; see the September 11, 1998, Federal Register, Vol. 63, No. 176, pages 48819-48847)." (U.S. EPA, 1998)

9. United States Environmental Protection Agency. Air Quality Designations and Classifications for the 8-Hour Ozone National Ambient Air Quality Standards; Early Action Compact Areas with Deferred Effective Dates. Federal Register: April 30, 2004, Volume 69, Number 84, Rules and Regulations, Page 23857-23951 available at http://www.epa.gov/fedrgstr/EPA-AIR/2004/April/Day-30/a9152.htm. (U.S. EPA, 2004a)

10. United States Environmental Protection Agency. Air Quality Designations and Classifications for the Fine Particles (PM2.5) National Ambient Air Quality Standards. December 17, 2004. (U.S. EPA, 2004b)

11. United States Environmental Protection Agency. National Ambient Air Quality Standards for Particulate Matter. September 21, 2006. (U.S. EPA, 2006)

II.

DEVELOPMENT OF PROPOSED AMENDMENTS

A. PUBLIC PROCESS FOR DEVELOPING PROPOSED LIMITS

In this Chapter, we discuss the process used to involve the public in developing the 2006 Amendments and the staff evaluation of emission reduction strategies. In order to involve the public in the development of the proposed 2006 Amendments, a subcommittee of the Consumer Products Working Group, titled the Consumer Products Regulation Workgroup (CPRWG), was established in 2004. Participation in the CPRWG was open to any member of the public. The CPRWG participated in the development of the 2003 Consumer and Commercial Products Survey (2003 Survey) and 2006 Amendments. Numerous meetings were held with the CPRWG during the development of the 2003 Survey and, later, during the development of the 2006 Amendments. The 2003 Survey and related efforts are described in more detail below in section C.

Consumer product manufacturers, chemical producers, and marketers, and their trade associations, have been the most active in the process. The trade associations include the following:

- Adhesives and Sealants Council
- American Beauty Association
- American Chemistry Council
- Automotive Aftermarket Industry Association
- Automotive Specialty Products Association
- California Fire Chief Association
- California Grocers Association
- California League of Food Processors
- Consumer Specialty Products Association
- Cosmetic, Toiletry, and Fragrance Association
- Fire District Association of California
- Fragrance Materials Association
- International Sanitary Supply Association
- Motor & Equipment Manufacturers Association
- National Aerosol Association
- National Paint and Coatings Association
- Soap and Detergent Association
- Western Aerosol Information Bureau

In addition, representatives from local air districts and agencies, including the South Coast Air Quality Management District and U.S. EPA as well as many other individual consumer product manufacturers were involved in the process.

ARB staff maintains a mailing list of over 3,000 companies and interested parties, including environmental organizations, which received information throughout the development of the proposed amendments. In addition, we have established an electronic list serve to allow subscribers to receive pertinent information with over 1,300 subscribers.

Four public CPRWG meetings and one public workshop were conducted between January 2006 and September 2006 to develop the 2006 Amendments. At the first workgroup meeting on January 19, 2006, staff discussed the logistics and timeline for the upcoming consumer products regulatory activity. The meeting also served as a forum for communication regarding the 2003 Consumer and Commercial Products Survey Preliminary Data Summaries, and the development and schedule for the upcoming rulemaking process of the 2006 Amendments.

At the second CPRWG meeting on March 27, 2006, staff discussed the additions and adjustments made to the 2003 Consumer and Commercial Products Survey Preliminary Data Summaries. Staff also discussed a draft initial list of categories proposed for regulation.

At the third CPRWG meeting on June 1, 2006, staff discussed the development of the consumer products regulations that will be presented to the Board in November 2006. Staff also discussed the draft regulatory categories and initial draft proposed VOC limits, and other agenda items related to the regulatory effort.

At the fourth CPRWG meeting on July 25, 2006, staff discussed the draft regulatory category definitions with modified proposed VOC limits and other regulatory changes.

On August 25, 2006, staff released the Third Staff Proposal for Category Standards, Proposed Regulatory Categories, and other items to be addressed for the proposed 2006 Amendments. A key element of these documents was notification that the 2006 Amendments were to be bifurcated into two Board actions, one in November 2006 and another in 2007 (2007 Amendments).

At the Public Workshop for the 2006 Amendments on September 14, 2006, the staff proposal for modification to the Consumer Products Regulation was presented to the interested parties.

A chronology of the meetings held is shown in Table II-1. Workgroup meeting and workshop notices are contained in Appendix C.

To solicit additional information and comments, staff held numerous individual meetings, and teleconferences, with industry representatives. At several of these meetings, requested by industry associations, industry representatives presented technical information related to reformulating of products for consideration in the

rulemaking process. Staff also reviewed survey data, performed shelf surveys, and researched technical literature, patents, and trade journals during the development of the proposed 2006 Amendments.

ARB Planning Staff also held meetings with consumer product industry representatives to discuss the upcoming revision to the State Implementation Plan (SIP). Specifically addressed were ARB's inventory and modeling updates, which demonstrates the great need for further emission reductions from all source categories, including consumer products, to attain the new federal and State ambient air quality standards. Industry representatives were also invited to attend ARB's October 12, 2006, SIP Planning Symposium (Symposium). The Symposium will be an opportunity for all interested parties to provide input on the development of the 2007 SIP.

Table II-1
Chronology of Workgroup Meetings and Public Workshop

Date	Meeting	Location
January 19, 2006	1st Workgroup Meeting for the CPRWG	Sacramento, CA with teleconference available
March 27, 2006	2nd Workgroup Meeting for the CPRWG	Sacramento, CA with teleconference available
June 1, 2006	3rd Workgroup Meeting for the CPRWG	Sacramento, CA with teleconference available
July 25, 2006	4th Workgroup Meeting for the CPRWG	Sacramento, CA with teleconference available
September 14, 2006	1st Public Workshop for the 2006 Amendments	Sacramento, CA with teleconference available

B. STATUTORY REQUIREMENTS FOR EMISSION REDUCTIONS

In enacting section 41712 of the HSC, the Legislature gave the ARB authority to control emissions from a very diverse number of products sold statewide to household and commercial consumers. According to section 41712, "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.

Section 41712 requires the Board to adopt regulations to achieve the maximum feasible reduction in volatile organic compounds emitted by consumer products after making certain determinations. Prior to adoption, the Board must determine that adequate data exist to establish that the regulations are necessary to attain State and

federal ambient air quality standards and the regulations are commercially and technologically feasible and necessary. The regulations adopted by the Board can not require the elimination of a product form. Product form refers to the shape and structure of the product, such as liquid, solid, powder, gel, crystal, aerosol, or pump spray. Chapter III. Technical Basis for the Proposed Amendments describes the guidelines established by ARB staff to ensure that these statutory criteria are met.

The Board must consider the effect that the regulations proposed for health benefit products, antimicrobial products registered with the U.S. EPA, will have on the efficacy of those products in killing or inactivating agents of infectious diseases such as viruses, bacteria, and fungi. The Board must consider the impact the regulations will have on the availability of health benefit products to California consumers and consider recommendations from health professionals when developing VOC control measures for health benefit products.

The Board must also comply with its volatile organic compound emission reduction obligations under the 1994 State Implementation Plan (SIP), or any amendments thereto. ARB's SIP commitments are described in both the Executive Summary and in Chapter I. Introduction.

C. STAFF EVALUATION OF EMISSION REDUCTION OPPORTUNITIES

Development of the proposed 2006 Amendments began with the review of the 2003 Consumer and Commercial Products Survey (2003 Survey), conducted in 2004 and 2005 (ARB, 2003). The 2003 Survey requested information on about 250 categories of consumer products. These 250 categories comprise about two-thirds of the overall consumer products emissions inventory or about 160 tpd. Over 915 companies responded to the 2003 Survey with information on over 26,000 products. The 2003 Survey, in conjunction with an additional survey to be conducted in 2006, was designed to obtain the comprehensive information necessary to develop new consumer product emission standards that together would achieve a minimum emission reduction of 20-35 tpd by 2010.

The focus of the 2003 Survey was primarily on categories where an opportunity for emission reductions was identified. Complete data was needed to accurately develop the emissions inventory and to assess emission reduction opportunities for specific categories of consumer products. The reductions are needed to meet commitments in the SIP and SIP lawsuit settlement agreement. Reductions will be achieved through the setting of mass-based and possibly reactivity-based standards.

After the 2003 Survey data were compiled, staff prioritized product categories for possible regulation. This process began with the elimination of categories where staff believed no viable opportunity for reduction existed at the current time. As a result of this process, staff initially identified 61 product categories for potential emission reduction opportunities which included 21 previously unregulated categories.

After further review, staff postponed consideration of some product categories to provide adequate time to evaluate the feasibility of VOC reductions and/or time to address complicated technical issues. In addition, staff revised emission estimates to address product mis-categorization, products that were already regulated under local air district rules, and reporting errors.

During the workgroup and workshop process, staff presented specific proposals and alternatives to the public for consideration. The proposed VOC limits were developed based on the 2003 Survey results, input from interested parties, and identified repackaging opportunities and reformulation options. After additional investigation of the product categories, staff added some product categories, deleted other categories, reorganized categories based on similarities in product function or other criteria, and increased or reduced the proposed VOC limits for product categories based on technical information provided by interested parties and staff's research efforts. Staff went through multiple iterations of presenting proposals to the public, considering interested party comments, and performing data analyses, and as a result is currently proposing VOC limits for 15 product categories. The total VOC emissions from the 15 identified categories comprised approximately 26.2 tpd statewide in 2003.

D. ALTERNATIVES CONSIDERED

Government Code section 11346.2 requires the ARB to consider and evaluate reasonable alternatives to the proposed regulation and provide the reasons for rejecting those alternatives. Staff identified three alternative approaches to the setting of proposed VOC limits: "No Action," "Set Different VOC Limits," and "Set VOC Limits for Different Categories."

Alternative One- No Action

A "No Action" alternative would be to not adopt the proposed new measures (i.e., VOC limits), or delay adoption of the proposed new measures which would result in failure to meet our CONS-2 SIP and SIP lawsuit settlement commitments (See Chapter I. Introduction). In the case of not meeting the SIP commitments, there is a potential for loss of federal funds. Not meeting the SIP lawsuit settlement commitments could subject ARB to further litigation. The citizens of California would not benefit from the improved air quality that would result from the reduction of VOC emissions and ground-level ozone being proposed. However, this alternative would have no cost on business.

Alternative Two – Set Different VOC Limits

As was discussed in Subsection B above, staff thoroughly evaluated each category that was surveyed for which it was believed potential for emission reductions existed. Staff initially proposed limits that were perceived as attainable based on the information available at the time. Staff further evaluated the categories. Industry representatives provided additional information pertinent to the categories and in some

cases proposed alternative VOC limits. Staff analyzed each category and determined the most appropriate limit from all of the alternatives proposed or considered. Some of the limits were determined to be too high, in that they did not achieve the maximum feasible reductions, and others were determined to be too low, as they would have eliminated a product form, or were not deemed to be technologically or commercially feasible. The final proposal contained limits that were determined to obtain the maximum feasible reduction, were commercially and technologically feasible, preserved product forms as required by law, were cost effective, and together achieved the necessary emission reductions to meet the ARB's commitments.

Alternative Three – Set VOC Limits for Different Categories

Staff initially considered more than 50 categories for regulation. Upon further analysis of available information, other State and federal agency comments and industry comments, some categories were eliminated from consideration. After consulting with several health organizations, including the California Department of Health Services, staff determined the proposed limits would make the products ineffective. Accordingly, staff eliminated personal hand sanitizers from consideration. Staff believed, based on the available information, that it was not appropriate to regulate every category initially proposed. Considering all available information, staff determined that at this time for certain categories, the setting of VOC limits would not achieve significant reductions or could not be set such that it could be demonstrated that the limits were commercially or technologically feasible without further investigation.

However, staff is continuing to evaluate the technical feasibility of proposing VOC limits for a number of categories. These categories were identified in the Third Staff Proposal for Categories- March 2007, released on August 25, 2006, and available at: http://www.arb.ca.gov/consprod/regact/cpwg2006/cpwg2006.htm.

For this current action, staff is proposing VOC limits for 15 categories that would together achieve the maximum feasible reductions and meet the ARB's commitments. It should be noted that ARB has already set VOC limits for over 112 product categories with 145 VOC limits, and 36 categories of aerosol coatings achieving a 50 percent reduction in emissions from the regulated categories.

REFERENCE

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

III.

TECHNICAL BASIS FOR THE PROPOSED AMENDMENTS

In this Chapter, we discuss the Board's requirements to adopt regulations that are technologically and commercially feasible. Health and Safety Code section 41712 requires all consumer product regulations adopted by the Board to be technologically and commercially feasible. During the development of the Phase I and II consumer product regulations, the ARB staff established guidelines in setting the limits to ensure that these statutory criteria were met. Also, 1996 revisions to HSC section 41712 added a constraint that consumer product regulations not eliminate a product form. These guidelines and statutory criteria were followed in setting the proposed limits for the Mid-term Measures I and II categories, the 2004 Amendments and now for the 2006 Amendments. A detailed discussion of the technical basis for each proposed limit is included in Chapter VI of the Technical Support Document.

The VOC limits proposed in the 2006 Amendments were set based on the lower volatile organic compound (VOC) content technologies existing within a product category, or are based on low emitting technology transfer from other products. In doing this, staff made sure that the various product forms within each category would be preserved. For the majority of the categories proposed for regulation, there are products on the market which currently comply. Where there is low complying market share, lower emission technology exists that can provide a pathway for compliance. There are no complying products currently available in the market place for aerosol sanitizers or aerosol carburetor or fuel-injection air intake cleaners, although lower emission technology exists for achieving the proposed weight percent VOC limits. Below we will discuss the terms "technologically feasible" and "commercially feasible."

A. TECHNOLOGICALLY FEASIBLE

Health and Safety Code section 41712(b) requires the Board to adopt consumer product regulations that are "technologically feasible". Technological feasibility is a different concept than "commercial feasibility", and does not take into account the cost of the complying product. Staff believes that a proposed limit is technologically feasible if it meets at least one of the following criteria: (1) the limit is already being met by at least one product within the same category, or (2) the limit can reasonably be expected to be met in the time frame provided through additional development efforts.

In setting the proposed limits for the 2006 Amendment categories, staff made an effort, wherever possible, to ensure that multiple reformulation technologies exist which would allow products to comply. Proposed limits were set at VOC levels that staff determined could be met without increased use of Toxic Air Contaminants or ozone-depleting compounds. General reformulation options include addition of water with co-solvents, development of emulsion products, use of low vapor pressure volatile organic compound solvents, use of non-VOC propellants, and use of exempt solvents.

B. COMMERCIALLY FEASIBLE

Health and Safety Code section 41712(b) also requires the Board to adopt consumer product regulations that are "commercially feasible." The term "commercially feasible" is not defined in State law. In interpreting this term, the staff has utilized the reasoning employed by the United States Court of Appeals for the District of Columbia in interpreting the federal Clean Air Act. In the leading case of International Harvester Company v. Ruckelshaus, (D.C. Cir. 1973) 478 F. 2d 615, the Court held that the U. S. EPA could promulgate technology-forcing motor vehicle emission limits which might result in fewer models and a more limited choice of engine types for consumers, as long as the basic market demand for new passenger automobiles could be generally met.

Following this reasoning, the staff has concluded that a regulation is "commercially feasible" as long as the "basic market demand" for a particular consumer product can be met. "Basic market demand" is the underlying need of consumers for a product to fulfill a basic, necessary function. This must be distinguished from consumer "preference", which may be towards specific attributes of a particular product. A "preference" is the choice of consumers for a certain product or products based upon fragrance, cost, texture, etc. By way of example, a consumer may need a glass cleaner to remove soils, grease, dirt or grime from their windows. Glass cleaners are formulated with glycol ether solvents or with ammonia. Consumers may choose an ammoniated glass cleaner because they prefer the performance characteristics, or they may choose a non-ammoniated glass cleaner because they dislike the smell of ammonia. This distinction is not recognized by all parties. Some commenters have expressed the view that consumers do not have a "basic market demand" for a general class of products, but that consumers instead have a number of separate and distinct "basic market demands" for many specialty products with differing characteristics.

The ARB staff believes the consumer "preference" interpretation of "basic market demand" is inconsistent with the reasoning from the International Harvester case. To adopt such a narrow interpretation would be inconsistent with the clearly expressed legislative intent that "...the State board shall adopt regulations to achieve the maximum feasible reduction in reactive organic compounds emitted by consumer products..." (HSC section 41712(a)). In order to achieve emission reductions, manufacturers of high VOC products which perform the same basic function as lower VOC counterparts must reduce the VOCs in their products. It is expected that when a product formulation changes, some attributes of the product will also change. If ARB were to establish limits which accounted for every distinct feature of every product, then each product would require a limit unto itself. Using this approach, it would be impossible to achieve the maximum feasible reduction in VOC emissions because changes in formulation would change product features.

Every currently marketed product has some unique features that differentiate it from other products. Consumers who purchase a product have demonstrated a preference over other competing products. This distinction between "preference" and "basic market demand" was clearly made in the International Harvester case. In the

International Harvester case, the court stated that the proposed emissions limits would be feasible even though they might result in the unavailability of certain kinds of vehicles and engine types people preferred (e.g. fast "muscle" cars), as long as the basic market demand for passenger cars could be generally met. Applying this principle to consumer products, the proposed 2006 Amendments allow the basic market demand to be met for each product category, even though it may no longer be possible to manufacture products with some specific attributes. ARB staff believes that this approach complies with HSC section 41712.

IV.

NEED FOR EMISSION REDUCTIONS

California's extreme air quality problems require unique strategies for meeting federal and State ambient air quality standards. In this Chapter, we provide an overview of these air quality problems and the need for significant emission reductions from all sources of air pollution. We also describe the need for the regulation of consumer products and provide a summary of the emissions from the categories proposed for regulation. For a detailed summary of the product categories see Chapter VI.

A. AMBIENT AIR QUALITY STANDARDS

Federal and State ambient air quality standards have been established to protect California's population from the harmful effects of ozone and PM. An ambient air quality standard sets legal limits on the level of an air pollutant in the outdoor (ambient) air necessary to protect public health. Both the ARB and the U.S. EPA are authorized to set standards. A table summarizing the current federal and State ambient air quality ozone and PM standards is provided in Table IV-1.

VOC emissions from consumer products contribute to the formation of both ozone and fine PM. Other sources of VOCs include emissions from fuel combustion, coatings and paints. PM pollution is the result of both direct and indirect emissions. Direct sources of PM include emissions from fuel combustion and wind erosion of soil. Indirect PM emissions result from the chemical reaction of VOCs, NO_x, sulfur oxides and other chemicals in the atmosphere.

1. Ozone

Ozone formation in the lower atmosphere results from a series of chemical reactions between VOCs and nitrogen oxides in the presence of sunlight. The rate of ozone generation is related closely to both the amount and reactivity of VOC emissions as well as the amount of NO_x emissions available in the atmosphere (U.S. EPA, 1996; Seinfeld and Pandis,1998). Ozone is a colorless gas and the chief component of urban smog. It is one of the State's more persistent air quality problems. Ninety-three percent of Californians, or 35 million people, live in areas designated as nonattainment for the federal 8-hour ozone standard. California experienced 41 percent of the total national exposure based on analysis of population exposure conducted by ARB staff for the years 2000 through 2002 (ARB, 2006c). California occupies the top five spots and has six out of the top ten areas with the highest levels of ozone (2004 design values).

It has been well documented that ozone adversely affects respiratory function of humans and animals. Human health studies show that short-term exposure to ozone injures the lung (ARB, 2005, 2000b, 1997; U.S. EPA, 2006a, 1996). In some animal

studies, permanent structural changes with long-term exposures to ozone concentrations considerably above ambient were seen; these changes remain even after periods of exposure to clean air (U.S. EPA, 2006a, 1996). Exposure to levels of ozone above the current ambient air quality standard can lead to lung inflammation, lung tissue damage, and a reduction in the amount of air inhaled into the lungs. Ozone is a strong irritant that can cause constriction of the muscle cells in the airways that result in symptoms such as coughing, chest tightness, shortness of breath, and increased asthma symptoms (ARB, 2005; U.S. EPA, 1996). Ozone in sufficient doses can also increase the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Health effects associated with ozone exposure include hospitalizations, school absences, and premature mortality (ARB 2005).

The greatest risk is to those who are active outdoors during smoggy periods, such as children, athletes, and outdoor workers. Recent evidence suggests that ozone may be linked to the onset of new asthma in very active children (McConnell 2002). Ozone has also been associated with premature death. For the year 2005, premature deaths from ozone exposure in California are estimated at 630 deaths per year (ARB, 2005).

Not only does ozone adversely affect human and animal health, but it also affects vegetation throughout most of California resulting in reduced yield and quality in agricultural crops, disfiguration or unsatisfactory growth in ornamental vegetation, and damage to native plants. During the summer, ozone levels are often highest in the urban centers in Southern California, the San Joaquin Valley, and Sacramento Valley, which are adjacent to the principal production areas in the State's multibillion-dollar agricultural industry (USDA, 2006). ARB studies indicate that ozone pollution damage to crops is estimated to cost agriculture over $500 million dollars annually (ARB, 1987; 2006a).

2. Fine Particulate Matter

PM is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. As described above, PM can be directly emitted from sources, such as diesel PM, or can be produced indirectly from sources which emit precursors that are converted to PM by atmospheric processes. Particles 10 microns or less in diameter are defined as "respirable particulate matter" or "PM_{10}". PM_{10} and particles 2.5 microns or less in diameter ($PM_{2.5}$) can be inhaled deep into the lungs. $PM_{2.5}$ contributes significantly to regional haze and reduction of visibility in California. Besides reducing visibility, the acidic portion of PM (nitrates, sulfates) can harm crops, forests, aquatic and other ecosystems (ARB, 2002).

Extensive research indicates that exposure to outdoor PM_{10} and $PM_{2.5}$ levels exceeding current air quality standards is associated with increased risk of hospitalization for lung and heart-related illness, including emergency room visits for

asthma. PM exposure is also associated with increased risk of premature deaths, primarily in the elderly and people with pre-existing cardiopulmonary disease. Premature deaths linked to PM_{10} and $PM_{2.5}$ exposure are now at levels comparable to deaths from motor vehicle accidents and second-hand smoke. In children, studies have shown associations between PM exposure and reduced lung function, increased respiratory symptoms, and illnesses (ARB, 2002).

The ARB funded a long-term epidemiologic study that investigated the respiratory health of children in 12 cities in Southern California know as the "Children's Health Study" (CHS, 2004). The air quality in these 12 communities varies from good to moderate and poor. In the final report on the Children's Health Study, that was published on May 14, 2004, major results of the study included the following findings:

- Children living in communities with higher concentrations of $PM_{2.5}$, nitrogen dioxide, elemental carbon, and acid vapor have reduced lung function growth at age 18 than children growing up in cleaner communities. The concern is that this may represent an irreversible effect.

- Increased levels of acid vapor, ozone, nitrogen dioxide and PM_{10} were associated with reduced lung function growth.

- Children living in high ozone communities who participate in several team sports may be at greater risk of developing asthma than less active children living in the same communities.

- Children who moved away from their initial study community had increased lung function growth if their new community had lower PM levels, and had decreased lung function growth if their new community had higher PM levels. Moving to a cleaner community may not completely compensate for the reduced growth associated with higher levels of air pollution.

- School absences due to respiratory illnesses are significantly higher on days with higher ozone levels.

- Children with asthma who were exposed to high concentrations of PM were more likely to develop bronchitis.

3. Ambient Air Quality Standards

The federal and State ambient air quality standards for ozone and PM are shown in Table IV-1. In April 2005, the Board reviewed California's 1-hour standard for ozone and determined that it alone was not sufficiently protecting human health. Consequently, ARB adopted a new 8-hour standard at 0.070 parts per million (ppm) for ozone while retaining the existing 1-hour ozone standard at 0.09 ppm. California's new 8-hour ozone standard at 0.070 ppm is more stringent than the federal 8-hour ozone standard of 0.08 ppm. In 1997, the U.S. EPA replaced the national 1-hour ozone

standard of 0.12 ppm with an 8-hour ozone standard of 0.08 ppm (U.S.EPA, 1997a). Regarding particulate matter, in 2002, the Board passed new, stricter standards for PM. The newly adopted standards include a PM_{10} annual average standard of 20 micrograms per cubic meter ($\mu g/m^3$), and a new annual average $PM_{2.5}$ standard of 12 $\mu g/m^3$. Also, the State PM_{10} standard for a 24-hour period is 50 $\mu g/m^3$. The national 24-hr standard for PM_{10} is 150 $\mu g/m^3$, and for $PM_{2.5}$ it is 65 $\mu g/m^3$.

Table IV-1
Ambient Air Quality Standards for Ozone and $PM_{10 \text{ and } 2.5}$[1]

Pollutant	Averaging Time	State Standard	National Standard
Ozone	1 hour	0.09 ppm (180 $\mu g/m^3$)	0.12 ppm (235 $\mu g/m^3$)
	8 hour	0.070 ppm	0.08 ppm (157 $\mu g/m^3$)
PM_{10}	24 hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual Arithmetic Mean	20 $\mu g/m^3$	50 $\mu g/m^3$
$PM_{2.5}$	24 hour	---------	65 $\mu g/m^3$
	Annual Arithmetic Mean	12 $\mu g/m^3$	15 $\mu g/m^3$

Source: Air Resources Board, Ambient Air Quality Standards, May 17, 2006 (ARB, 2006b).

4. Area Designations

The CCAA was enacted in 1988, and has the fundamental goal that all areas of California are to attain the State ambient air quality standards for ozone by the earliest practicable date. As specified in the CCAA, the ARB has designated areas of California to be in "attainment" or "nonattainment" for the State ozone standards. Figures IV-1 and IV-2 show that unhealthy levels of ozone and $PM_{2.5}$ are not limited to just urban areas, but can be found in nearly every county in California. The figures show the counties designated as nonattainment (or nonattainment-transitional, which is a subcategory of nonattainment) for the year 2004, for the State ozone and $PM_{2.5}$ standards. These maps clearly indicate the extent and magnitude of the ozone and $PM_{2.5}$ problems in California. ARB has plans to update area designations in Fall 2006 and expect numerous areas will be re-designated non-attainment.

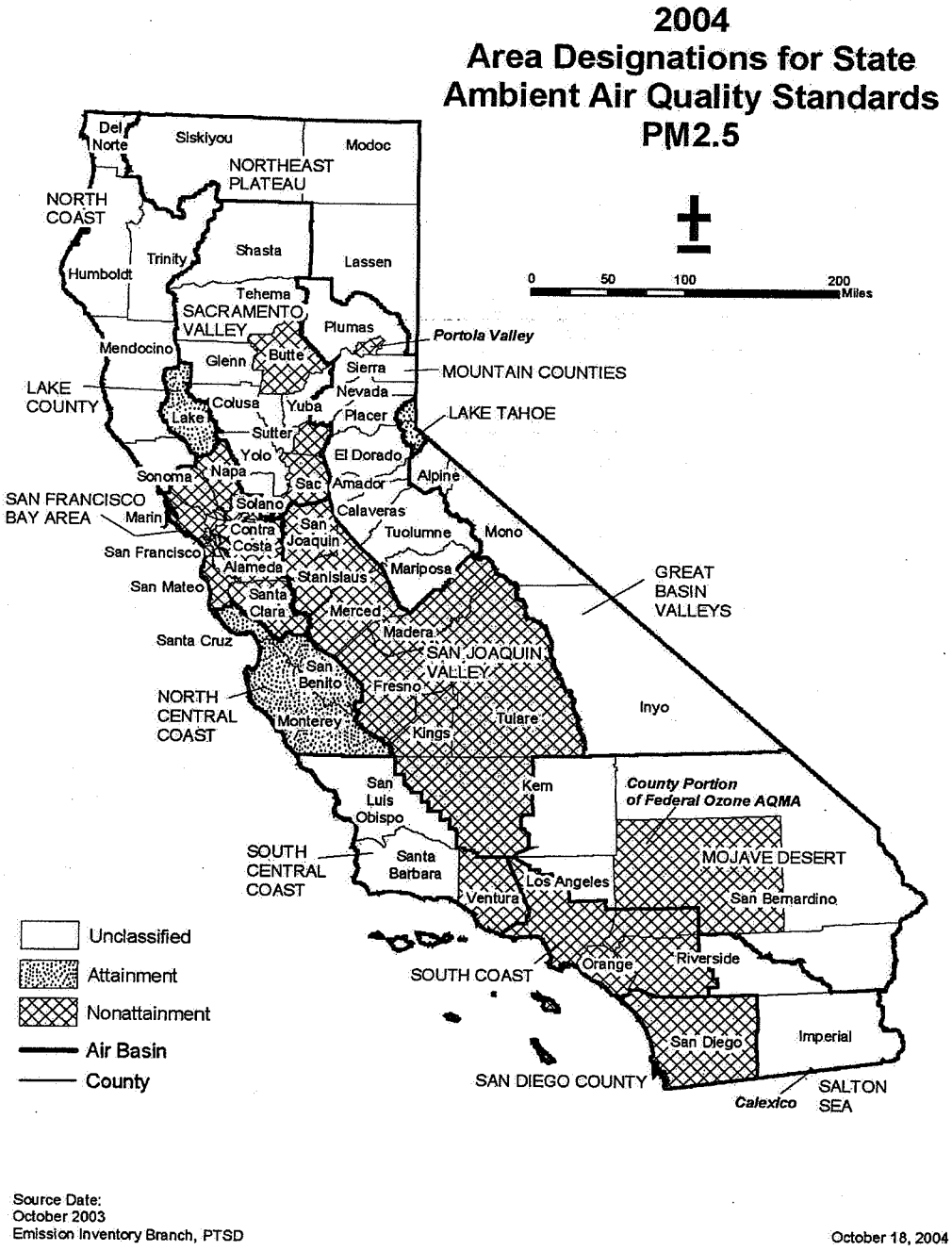
[1] On September 21, 2006, U.S. EPA announced a more stringent 24-hour PM standard. Final designations for the new standard are scheduled to be promulgated in 2009 (U.S. EPA, 2006b).

Figure IV-1

Source Date:
October 2003
Emission Inventory Branch, PTSD

October 18, 2004

Figure IV-2



Source Date:
October 2003
Emission Inventory Branch, PTSD

October 18, 2004

The local air districts in areas that are nonattainment for the State ozone standards are required by the CCAA to prepare plans. These plans must be designed to achieve and maintain the standards by the earliest practicable date. Each nonattainment district is also required to update its plan every three years to include the latest technical information, and any changes in demographics or other relevant information. In developing its plan, each district determines which measures are necessary to include, as well as the specific details of each included measure. In many of the nonattainment districts, substantial additional emission reductions will be necessary in order to achieve and maintain the State ozone standards.

The areas that are nonattainment for the State ozone standards are also nonattainment for the federal 8-hour ozone standard. New nonattainment designations include a number of rural Sierra foothill counties and additional parts of the Sacramento Valley. The federal one-hour standard was revoked on June 15, 2005, one year after the effective date of the designations. SIPs showing how each nonatttainment area will meet the eight-hour ozone standard are due by 2007. In order to maintain progress towards clean air, the federal Clean Air Act prohibits backsliding on the control program. Since the federal eight-hour ozone standard is more health-protective than the one-hour ozone standard, ARB expects that California will need to reduce emissions beyond the existing one-hour Ozone SIP targets.

Recent air quality trends have shown that progress is being made towards achieving clean air. In the South Coast Air Basin, the year 2005 was one of the cleanest air quality years on record, with the fewest days ever recorded for violations of the tough federal 8-hour ozone health standard. Air quality during this year's smog season exceeded the federal 8-hour ozone health standard on 84 days, compared to 90 days in 2004. The one-hour ozone average, no longer a regulatory standard but still an important air quality benchmark, was exceeded on 30 days in 2005, a slight increase from the 28 days of 2004 (SCAQMD, 2005). As shown in Figure IV-3, the smog trend in the South Coast Air Basin has been declining, as measured by the number of days over the federal one-hour ozone standard and the maximum one-hour ozone concentration.

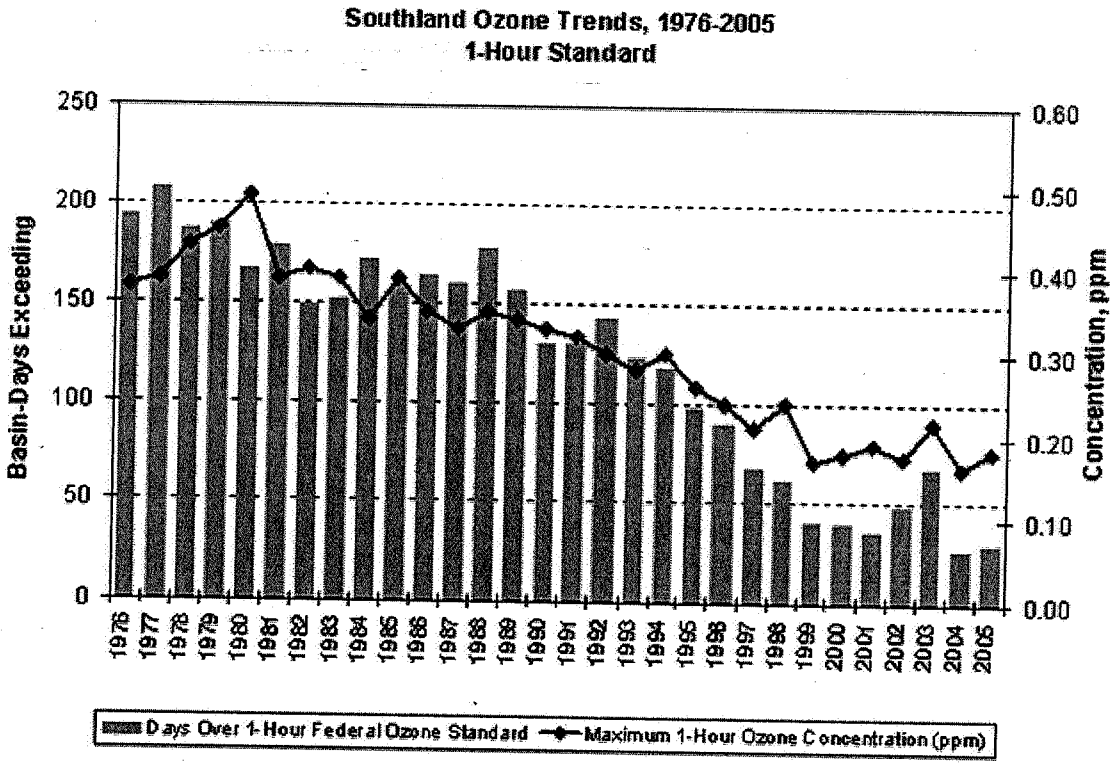
In the San Joaquin Valley Air Basin, the year 2005 was also one of the cleanest air quality years on record, with the fewest days ever recorded for violations of the tough federal 8-hour ozone health standard. Air quality during this year's smog season exceeded the federal 8-hour ozone health standard on 72 days, compared to 109 days in 2004. The one-hour ozone average, no longer a regulatory standard but still an important air quality benchmark, was exceeded on 8 days in 2005, a slight decrease from the 9 days of 2004 (ARB 2006 Almanac). As shown in Figure IV-4, the smog trend in the San Joaquin Valley Air Basin has been declining, as measured by the number of days over the federal one-hour ozone standard and the maximum one-hour ozone concentration.

Despite nearly 25 years of regulatory efforts and the decline of smog levels in areas such as the South Coast Air Basin and the San Joaquin Air Basin, ozone continues to be an important environmental and health concern in California and more

emission reductions are necessary. It is expected that further emission reductions will be needed from all source categories, including consumer products, to meet the long-term emission reduction targets included in the current SIPs. More reductions will also be needed to satisfy the new eight-hour ozone standard.

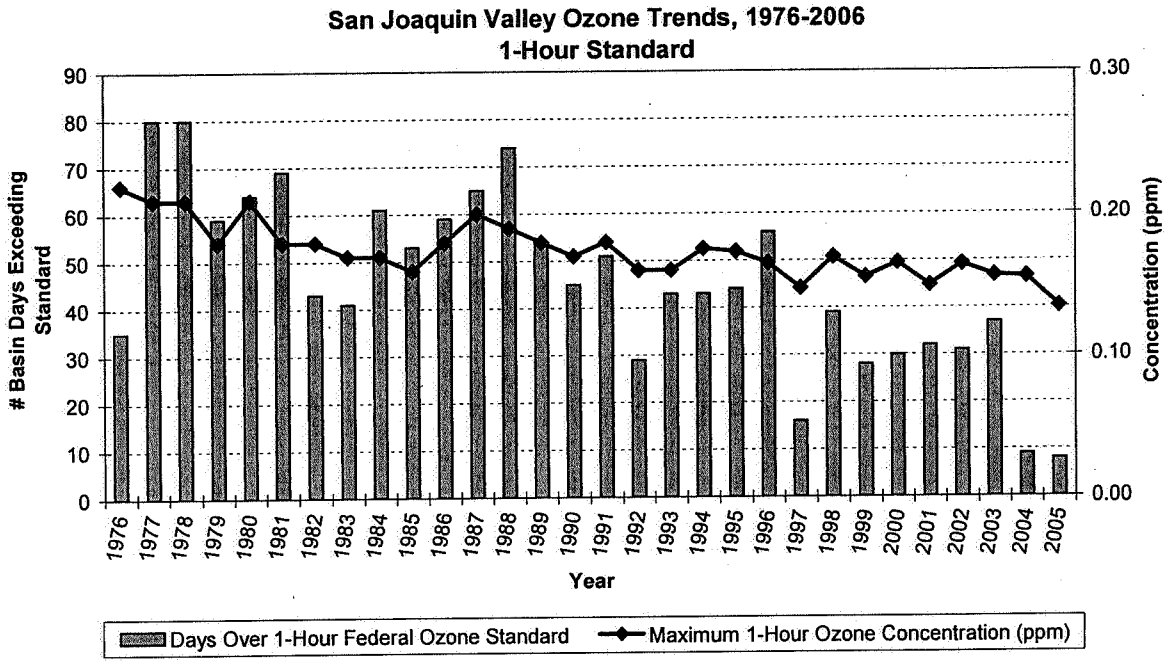
The important emission reductions that have been realized from the ARB's Consumer Products Program are expected to be partially offset by population growth, beginning in the year 2007. California's population is expected to grow to 40 million by 2010 (DOF, 2006). Therefore, ARB must continue its commitment to pursue additional technologically and commercially feasible reductions in consumer products emissions.

Figure IV-3
South Coast Air Basin Smog Trend



Source: South Coast Air Quality Management District, November 18, 2005 (SCAQMD, 2005).

Figure IV-4
San Joaquin Valley Air Basin Smog Trend



Source: ARB 2006 Almanac

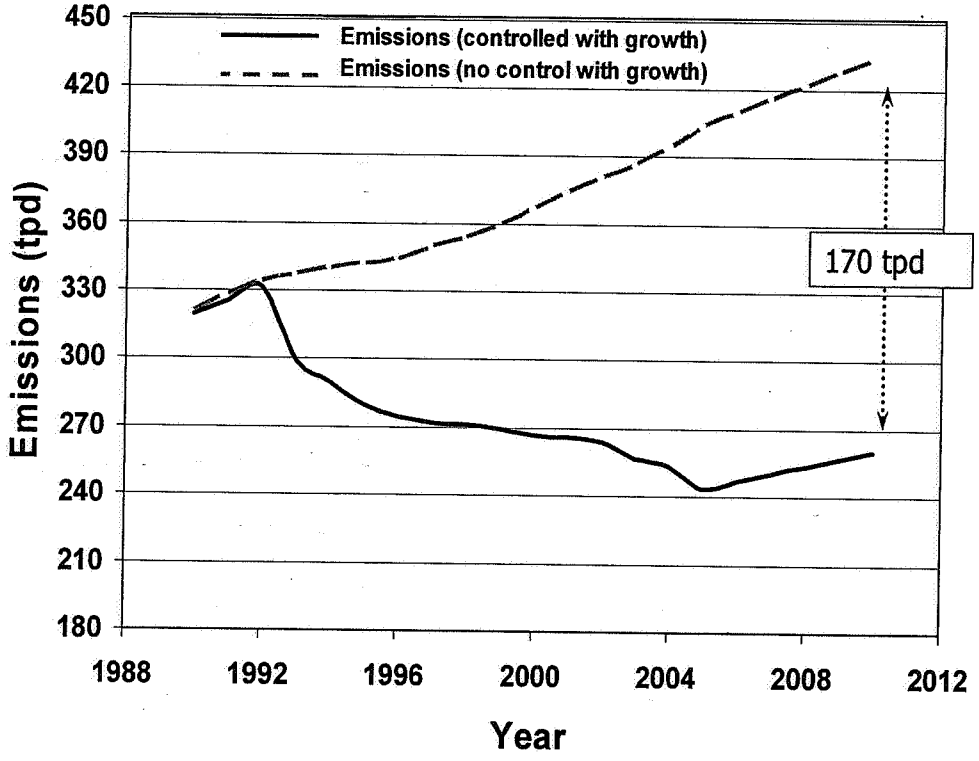
B. WHY REGULATE CONSUMER PRODUCTS?

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. Other paint products, such as furniture or architectural coatings, are not part of ARB's consumer products program because local air districts regulate them.

Consumer products are a significant source of VOC emissions in California and contribute to the formation of both ozone and particulate matter pollution. Although each consumer product may seem to be a small source of emissions, the cumulative use of these products by over 37 million Californians (DOF, 2006) results in significant emissions. According the California Almanac of Emissions & Air Quality, 2006 Edition, consumer products accounted for 259 tpd of VOC emissions in the year 2005, which comprised over ten percent of the total VOC emissions statewide (ARB 2006 Almanac). VOC emissions from consumer products lead to the formation of ozone and are a significant source of air pollution in California. Further reductions in VOC emissions from consumer products and other VOC sources are needed if ozone standards are to be achieved.

As a result of several regulations adopted by the ARB over the last fifteen plus years, emissions from consumer products and aerosol coatings have decreased, and continued reductions are projected through 2006. As a result of these measures, statewide consumer product VOC emissions have been reduced by over 170 tpd in 2010. Due to population growth, and without additional controls, staff expects the trend of emissions reductions to reverse once the currently adopted standards takes effect in 2006.

Figure IV-5
Consumer Products Emissions and Reductions 1990-2010



Source: ARB 2006 Almanac

Over the past 25 years, air pollution agencies in California have been working diligently to improve air quality. Much of the effort was directed to the more traditional sources of air pollution such as mobile sources (e.g., cars, trucks, etc.) and stationary sources (e.g., factories, power plants, etc.). There have been dramatic gains in reducing emissions from these traditional sources. However, to continue to make progress toward meeting the State and federal ambient air quality and protecting the public health of California citizens, there is a need for further reductions from other sources of emissions including consumer products. Also, as emissions from traditional sources are further reduced, emissions from all other sources, including consumer products, have become more significant. Therefore, the emissions from these sources must be evaluated for possible reductions.

Airshed modeling conducted during development of California SIPs has shown that VOC emission reductions lead to reduced ozone in metropolitan areas. Depending on the area, NO_x emission reductions can lead to reductions or increases in peak ozone concentrations. Due to low VOC to NO_x ambient ratios in the South Coast Air Basin, NO_x emission reductions lead to increases in the basin peak ozone concentration on episodic days. However, NO_x emission reductions are necessary to reduce secondary PM nitrate concentrations. During the SIP development modeling process, the NO_x emission target is identified during the PM planning phase. A series of emission reduction simulations are made to estimate a "target" carrying capacity for VOC for the given basin NO_x emission level. Many control measures are needed to reduce both VOC and NO_x emissions to the desired target levels. This VOC – NO_x interaction is discussed further in the "Final Program Environmental Impact Report, Suggested Control Measure for Architectural Coatings," June 2000 (ARB, 2000a).

Previous modeling studies for the South Coast Air Basin have shown that consumer product VOC emission reductions reduce both ozone peak concentrations and population exposure to ozone (ARB, 1996). Therefore, consumer products control measures represent an important part of the VOC reductions needed to achieve the ozone standards.

In 1988, the CCAA was made law. The Act declared that attainment of the California State ambient air quality standards is necessary to promote and protect public health, particularly the health of children, older people, and those with respiratory diseases. The Act added section 41712 to the HSC, which requires the ARB to adopt regulations to achieve the maximum feasible reduction in VOCs emitted by consumer products. As part of the regulatory process, the ARB must determine that adequate data exist to adopt the regulations. The ARB must also determine that the regulations are technologically and commercially feasible, necessary, and do not eliminate any product form. To date, 145 VOC standards for 112 categories of consumer products (including antiperspirants and deodorants and aerosol coatings - 36 categories) have been established to meet the requirements of the Act.

The five regulations adopted to date will achieve over 40 percent reduction in overall VOC emissions from consumer products by the year 2008. Since significant further VOC reductions are necessary to attain the federal ozone standard, the reductions from the 2006 Amendments proposed in this report are therefore "necessary" within the meaning of section 41712 of the HSC. In addition, section 41712(b) (1) of the HSC provides that a regulation's "necessity" is to be evaluated in terms of both the State and federal standards. The 2003 Statewide Strategy only addresses the ARB's commitments to achieve the federal 1-hour air quality standard for ozone. Both the federal eight-hour and the State standards are more stringent than the federal 1-hour standard, and will require even greater emission reductions to achieve attainment.

The applicable State and federal laws show that both the U.S. Congress and the California Legislature intended progress toward clean air to be made as quickly as

possible. The Act specifically declares that it is the intent of the Legislature that the State air quality standards be achieved "...by the earliest practicable date..." (See HSC, sections 40910 and 40913(a); see also the uncodified section 1(b)(2) of the Act (Stats. 1988, Chapter 1568)). A similar intent is expressed in the federal Clean Air Act, which declares that the federal air quality standards are to be achieved "...as expeditiously as practicable..." (See sections 172(a)(2), 181(a), and 188(c) of the federal Clean Air Act). For all of the reasons described above, the proposed amendments are "necessary" within the meaning of section 41712 of the HSC.

On November 15, 1994, ARB adopted the California State Implementation Plan for Ozone (1994 SIP). The 1994 SIP serves as California's overall plan for attaining the federal ambient air quality standard for ozone. Achieving significant VOC reductions from consumer products is a key element of the SIP. The consumer products element of the SIP is comprised of Near-term, Mid-term, and Long-term Measures. The Near-term Measures are comprised of the Phase I and II consumer products regulations (and other ARB regulations related to consumer products). The Mid-term Measures commitment was fulfilled by the Mid-term Measures I and II amendments to the Consumer Products Regulation.

In 1997, three environmental groups (Communities for a Better Environment, the Coalition for Clean Air, and the Natural Resources Defense Council) filed a complaint in the United States District Court for the Central District of California. The lawsuit was filed against ARB, the South Coast Air Quality Management District, and the U.S. EPA related to California's progress in achieving the 1994 SIP commitments. In January 1999, the ARB and these groups reached a settlement agreement, which was amended in December 1999 and June 2003 (U.S. District Court, Central District of CA, Case No. CV-97-6916 JSL (SHx)) (Settlement, 1999). Although the SIP was revised in October 2003 (discussed below) to replace the State's original commitments under the 1994 SIP for the South Coast, the settlement agreement will remain in place until ARB fulfills its obligations under the agreement.

The settlement agreement included a list of measures to be considered by the ARB and a schedule. Included in the list of specific measures, the ARB staff committed to develop a measure by 2004, and implement by 2006, that would achieve VOC emission reductions from consumer products of at least 2.3 tons per day (tpd) in the South Coast Air Basin in 2006. The adopted 2004 Amendments to the Consumer Products Regulation fulfilled ARB's first settlement agreement relating to the consumer product category.

The second commitment in the settlement agreement was to propose to the ARB a measure to be implemented by 2008 that would achieve 4-8 tpd VOC emission reductions in the South Coast Air Basin. The 2006 Amendments proposed in this staff report fulfill the last of the consumer products related commitments in the SIP settlement agreement.

On October 23, 2003, ARB adopted the 2003 Statewide Strategy which reaffirms ARB's commitment to achieve the health-based air quality standards through specific near-term actions and the development of additional longer-term strategies. In the 2003 Statewide Strategy, ARB committed to two primary measures specific to consumer products and future reductions:

- **Measure CONS-1: Set New Consumer Products Limits for 2006.** The ARB committed to develop a measure to be proposed to the Board by 2004 and implemented by 2006 that would reduce VOC emissions from consumer products by at least 5.3 tpd statewide in 2010. This was achieved on June 24, 2004, when the Board adopted the 2004 Amendments to the Consumer Products Regulation.

- **Measure CONS-2: Set New Consumer Products Limits for 2008-2010.** The ARB has committed to develop new consumer product category limits to be proposed to the Board in 2006 and 2008, with implementation in 2008 and 2010, which would reduce VOC emissions from consumer products by 20-35 tpd statewide in 2010.

- **Further Reductions from Consumer Products.** In addition, it is expected that further emission reductions will be needed from all source categories, including consumer products, to meet the long-term emission reduction targets included in the South Coast SIP.

The 2003 Statewide Strategy also set 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 and San Joaquin Valley (U.S. EPA, 2004a, 2004b). Significant reductions will be needed in both the South Coast Air Basin and the San Joaquin Valley Air Basin to meet the new standards.

The 2006 Amendments proposed in this staff report are intended to partially fulfill the commitment for SIP Measure CONS-2.

C. ESTIMATED EMISSIONS FROM CATEGORIES PROPOSED TO BE REGULATED

1. 2003 Consumer & Commercial Products Survey

The 2003 Consumer and Commercial Products Survey (2003 Survey) was mailed to over 3,000 companies in November 2004 (Appendix D). The 2003 Survey requested data on 250 categories of consumer products. Extensive outreach efforts were made to maximize the market coverage of the 2003 Survey. First, we performed numerous shelf surveys, conducted trade journal and Internet searches and scrutinized results from previous surveys to identify manufacturers and add them to our mailing list. Following the 2003 Survey, shelf surveys were again performed, and the list of responding companies was scrutinized by trade associations and survey respondents to identify additional companies which had not responded. Companies that did not initially

respond to the survey were contacted, requested to submit the required information, and subsequently, many additional surveys were submitted. The extensive outreach resulted in an estimated 85 to 90 percent market coverage in most categories.

The 2003 Survey requested detailed information on the formulations of consumer products, including complete speciation of VOC's, low vapor pressure VOC (LVP-VOC) solvents, and key exempt ingredients, as well as total volumes of inorganic and exempt compounds. Information on sales, product form, customer types, and company size and economics were also requested. Due to the complexity of the data, staff thoroughly reviewed incoming surveys to ensure accuracy prior to entry in the database. When inconsistencies were found, we contacted the survey respondents and made the necessary corrections. Many corrections were made to formulation data to appropriately classify compounds as VOCs, LVP-VOCs, exempt compounds, or inorganic compounds. Prior to entry into the consumer products database, we made every effort to verify and correct the 2003 Survey data.

To further ensure the accuracy of the 2003 Survey data, we provided extensive summaries to industry detailing the aggregate sales, VOC speciation, VOC tonnage, and other key information. Summary tables were also provided (certain specific data was omitted to protect confidential information), detailing VOC content, product form, LVP-VOC content, and other information. The results of the 2003 Survey were discussed at workgroup meetings, and input from industry was used to correct inaccuracies in the data.

To minimize the burden to industry, we developed software to allow manufacturers to submit their surveys electronically. The software aided many manufacturers in reporting large numbers of products and also performed certain data checks automatically. We also developed software to automate calculations of emissions, emission reductions, market coverage and other frequently performed calculations.

Over 915 companies responded to the 2003 Survey, reporting over 26,000 products sold in California. The 2003 VOC emissions from the consumer product categories surveyed are estimated to be about 160 tons per day, representing an estimated two-thirds of the total consumer products inventory, on an emissions basis.

Market Coverage Adjustments to the Survey

It is not possible for a survey of this magnitude to reach the entirety of the consumer products industry. Therefore, staff performed shelf surveys to determine the appropriate market coverage adjustment for each category proposed for regulation. Adjustments were made based upon the number of products found on store shelves that were not reported in the Survey. Generally, we found about 8 or 9 out of every 10 products had been reported. Hence, for most categories, the market coverage was estimated to be about 85 to 90 percent.

Some market sectors have historically had a low response rate in previous surveys. For example, in the 1997 Survey effort, it was discovered that automotive windshield washer fluids are frequently produced by small companies which move in and out of the market, so tracking these companies and maintaining a complete mailing list is difficult (ARB, 1999). For categories where the coverage was determined to be low, adjustments were made by a variety of methods, including previous survey data, and estimates from industry publications, etc. This additional adjustment of 25 percent (indicating a 75 percent market coverage) was made in only one, Temporary Hair Color (aerosol), of the 15 categories proposed for regulation.

Adjustments to the inventory to account for the incomplete market coverage inherent in the survey process is not without precedent. The U.S. EPA, in compiling their emissions estimates for their 1990 survey, increased the sales in most categories to account for incomplete market coverage. In addition, the 1994/1995 Mid-term Measures Survey and the 1997 Survey results were also adjusted (ARB, 1999). Staff worked with industry members during the development of the 2004 Amendments to determine the 2001 Survey coverage, and made adjustments to initially proposed market coverage factors (ARB, 2004).

Emission Estimates for Categories

The total emissions from the 15 categories proposed for regulation in the 2006 Amendments is estimated to be 26.2 tons per day in 2003. Table IV-2 summarizes these emissions.

Adequate Data

With our estimate of 90 percent market coverage for most categories, we feel confident that the Survey had adequate representation of the available technologies in the market place. This assumption has been verified by discussions with manufacturers, category research and the wide range of VOC content reported for products in the categories slated for regulation.

Historically for many product categories, the market sector with the lowest coverage is the "private label" sector. The private label market sector does not manufacture products. They purchase products from manufacturers, and then put their own brand name on them. Those products generally employ the same technologies as other products made by manufacturers. Staff made extra effort to contact, work with, and obtain surveys from private labelers. We believe that this effort has improved the response from these responsible parties. Therefore, staff believes that because the 2003 Survey had excellent response from the primary manufacturers and good response from private labelers, and that the survey contained adequate information on most if not all technologies available in the marketplace.

Staff has worked extensively with industry representatives on each category proposed for regulation. In meetings with members of industry, extensive discussions

on the types of technologies used in each category were discussed. Numerous product labels and associated literature for each category were analyzed. Category information was also obtained from trade journals, Internet sites, textbooks, and directly from manufacturers.

Table IV-2
VOC Emissions by Product Category

Product Category	Product Form	2003 VOC Emissions Adjusted* (Tons/Day)	2003 VOC Emissions Reductions* (Tons/Day)
Automotive Windshield Washer Fluid (Type "A" Areas)	All	1.70	0.31
Bathroom and Tile Cleaner	Non-aerosol	0.40	0.13
Brake Cleaner	All	4.84	3.70
Carburetor or Fuel-Injection Air Intake Cleaner	All	2.61	2.00
Construction, Panel and Floor Covering Adhesive	Non-aerosol	1.27	0.41
Disinfectant	Aerosol Non-aerosol	6.80 1.68	0.66 0.49
Engine Degreaser	Aerosol	1.05	0.62
Floor Polish or Wax: for resilient flooring material for nonresilient flooring material	 All All	 0.66 0.07	 0.43 0.05
Furniture Maintenance Product	Non-aerosol	0.17	0.06
General Purpose Cleaner	Aerosol	0.34	0.05
General Purpose Degreaser	Aerosol	0.98	0.70
Laundry Starch/Sizing/Fabric Finish Product	All	1.12	0.06
Oven Cleaner	Non-aerosol	0.30	0.09
Sanitizer	Aerosol Non-aerosol	1.41 0.47	0.46 0.33
Temporary Hair Color	Aerosol	0.30	0.13

* VOC emissions for each category have been adjusted for survey market coverage.
Source: 2003 Consumer and Commercial Products Survey (ARB, 2003).

REFERENCES

1. Air Resources Board, Staff Report. Effect of Ozone on Vegetation and Possible Alternative Ambient Air Quality Standards. March, 1987. (ARB, 1987)

2. Air Resources Board. Consumer Products Working Group Meeting: A Brief Overview of Photochemical Grid Modeling. October 1996. (ARB, 1996)

3. Air Resources Board. Letter to Ms. Mary Nichols, United States Environmental Protection Agency. ARB Comments on U.S. EPA Proposals for New, National Clean Air Goals and Policies. March 11, 1997. (ARB, 1997)

4. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September, 10, 1999. (ARB, 1999)

5. Air Resources Board. Final Program Environmental Impact Report Suggested Control Measure for Architectural Coatings, June 2000. (ARB, 2000a)

6. Air Resources Board and Office of Environmental Health Hazard Assessment. Adequacy of California Ambient Air Quality Standards: Children's Environmental Health Protection Act. December 22, 2000, available at http://www.arb.ca.gov/research/ambient air qualitys/cambient air qualitys/ad-ambient air qualitys/ad-ambient air qualitys.htm. (ARB, 2000b)

7. Air Resources Board and Office of Environmental Health Hazard Assessment. Staff Report: Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates, available at http://www.arb.ca.gov/research/ambient air qualitys/std-rs/pm-final/pm-final.htm. (ARB, 2002)

8. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

9. Air Resources Board. Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for Para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products. May 7, 2004. (ARB, 2004)

10. Air Resources Board. Review of the California Ambient Air Quality Standard for Ozone, available at http://www.arb.ca.gov/research/ambient air qualitys/ozone-rs/rev-staff/rev-staff.htm. October 2005. (ARB, 2005)

11. Air Resources Board. The California Almanac of Emissions and Air Quality – 2006 Edition. 2006. (ARB 2006 Almanac)

12. Air Resources Board, Memorandum. Update to California Crop Loss Due to Ozone. From Stephen Shelby to Judy Yee. September 12, 2006. (ARB, 2006a)

13. Air Resources Board. Ambient Air Quality Standards. May 17, 2006. (ARB, 2006b)

14. Air Resources Board, Comparison of California's Ozone Problem to the Rest of the Country, July 29, 2006. (ARB, 2006c)

15. Department of Finance. Report: State Adds 444,000 in 2005: 2006 Population Nears 37.2 Million. May 1, 2006. (DOF, 2006)

16. McConnell, R., K. Berhane, F. Gilliland, S.J. London, T. Islam, W.J. Gauderman, E. Avol, H.G. Margolis, and J.M. Peters. Asthma in exercising children exposed to ozone: A cohort Study. Lancet, 359:386-391. (McConnell *et al.,* 2002)

17. Peters, John M., M.D., Sc.D. Prepared for the California Air Resources Board and the California Environmental Protection Agency, Epidemiologic Investigation to Identify Chromic Effects of Ambient Air Pollutants in Southern California, Contact No. 94-331, Children's Health Study, that was published on May 14, 2004. (CHS, 2004)

18. Settlement Agreement, with amendments, in *Coalition for Clean Air, Inc. et al. v. South Coast Air Quality Management District, et al.* (U.S. District Court, Central District of CA, Case No. CV-97-6916 JSL (SHx)), Final January 23, 1999; First Amendment to Settlement Agreement, December 9, 1999; Second Amendment, June 25, 2003. (Settlement, 1999)

19. Seinfeld, John H., and Pandis, Spyros N. Atmospheric Chemistry and Physics-From Air Pollution to Climate Change. John Wiley & Sons, New York, 1998. (Seinfeld and Pandis, 1998)

20. South Coast Air Quality Management District. 2005 Southland Smog Season on of the Cleanest on Record. November 18, 2005. Webpage available at http://www.aqmd.gov/news1/2005/SmogSeason2005.htm. (SCAQMD, 2005)

21. United States Department of Agriculture. Agricultural Outlook: Statistical Indicators, Table 34.-Cash Receipts from Farm Marketing, by State (July 2006), available at http://www.ers.usda.gov/Publications/Agoutlook/AOTables/. (USDA, 2006)

22. United States Environmental Protection Agency. Air Quality Criteria for Ozone and Related Photochemical Oxidants. July, 1996, Volume I and III. (U.S. EPA, 1996)

23. United States Environmental Protection Agency. National Ambient Air Quality Standards for Ozone; Final Rule. Federal Register. July 18, 1997, Volume 62, Number 138, Page 38855-38896, available at http://www.epa.gov/fedrgstr/EPA-AIR/1997/July/Day-18/a18580.htm. (U.S. EPA, 1997a)

24. United States Environmental Protection Agency. National Ambient Air Quality Standards for Particulate Matter; Final Rule. Federal Register. July 18, 1997, Volume 62, Number 138, Page 38651-38701, available at http://www.epa.gov/fedrgstr/EPA-AIR/1997/July/Day-18/a18577a.htm. (U.S. EPA, 1997b)

25. United States Environmental Protection Agency. Final Rule to Implement the 8-Hour Ozone National Ambient Air Quality Standard – Phase 1, Federal Register: 69 23951 (April 30, 2004), available at http://www.epa.gov/ozonedesignations/finalrule.pdf. (U.S. EPA, 2004a)

26. United States Environmental Protection Agency. Air Quality Designations and Classifications for the Fine Particles (PM2.5) National Ambient Air Quality Standards. December 17, 2004. (U.S. EPA, 2004c)

27. United States Environmental Protection Agency. Review of the National Ambient Air Quality Standards for Ozone: Policy Assessment of Scientific and Technical Information OAQPS Staff Paper – Second Draft, July 2006, available at http://www.epa.gov/ttn/naaqs/standards/ozone/s_o3_cr_sp.html. (U.S. EPA, 2006a)

28. United States Environmental Protection Agency. National Ambient Air Quality Standards for Particulate Matter. September 21, 2006. (U.S. EPA, 2006b)

V.

PROPOSED AMENDMENTS TO THE CONSUMER PRODUCTS AND AEROSOL COATINGS REGULATIONS

In this Chapter, we provide a plain English discussion of the proposed amendments to the California Regulation for Reducing Volatile Organic Compound (VOC) Emissions from Consumer Products (the 2006 Amendments), the Regulation for Reducing the Ozone Formed from Aerosol Coating Product Emissions (the Aerosol Coatings Regulation), and explain the rationale for the amendments.

Where applicable, key terms or concepts involved in each amendment are described. The discussion in this Chapter is intended to satisfy the requirements of Government Code Section 11343.2, which requires that a noncontrolling "plain English" summary of the regulation be made available to the public. The proposed Consumer Products and the Aerosol Coating Products Regulations can be found in Appendix B.

Amendments are being proposed to 7 Sections in the Consumer Products Regulation, Section 94508 "Definitions;" Section 94509 "Standards for Consumer Products;" Section 94510 "Exemptions;" Section 94511 "Innovative Products;" Section 94512 "Administrative Requirements;" Section 94513 "Reporting Requirements;" and Section 94515 "Test Methods." We are also proposing to amend Section 94523, "Exemptions," of the Aerosol Coating Products Regulation. These amendments are discussed below in detail. No other significant amendments to the existing Consumer Products Regulations are being proposed.

A few of the more significant existing regulatory provisions that will apply to the 2006 Amendment categories are described below. However, for a more detailed discussion of the existing regulatory requirements, the reader is directed to the Phase I and Phase II Technical Support Documents, and the Mid-term Measures Initial Statement of Reasons (ARB, 1990; ARB, 1991; ARB, 1997; ARB, 1999).

Proposed Amendments to the Consumer Products Regulation

A. DEFINITIONS (SECTION 94508)

Section 94508, "Definitions," provides all the terms used in the Consumer Products Regulation which are not self-explanatory. The proposed amendments to the Regulation include new or revised definitions to help clarify and enforce the Regulation.

The following list, in Table V-1 comprises proposed new definitions that are needed for newly regulated product categories in the Consumer Products Regulation. Because of the proposed definition changes, Section 94508(a) would also be reorganized to reflect proper alphabetical order. Please see Chapter VI, which contains a detailed discussion related to each newly proposed individually regulated category:

Table V-1
New Definitions Proposed for Addition

Sanitizer
Temporary Hair Color

Table V-2, contains the list of existing definitions that are proposed to be modified to improve clarity or because within the definition they relate or refer to newly regulated categories:

Table V-2
Existing Definitions Proposed for Modification

All Other Forms
Anti-Static Product
Automotive Windshield Washer Fluids (Dilutable)
Automotive Windshield Washer Fluids (Pre-mixed)
Bathroom and Tile Cleaner
Brake Cleaner (formerly "Automotive Brake Cleaner")
Carburetor or Fuel-Injection Air Intake Cleaner
Construction, Panel, and Floor Covering Adhesive
Contact Adhesive
Disinfectant
Electronic Cleaner
Engine Degreaser
Existing Product
Fabric Protectant
Floor Polish or Wax
Furniture Maintenance Product
General Purpose Cleaner
Laundry Starch Product
Multi-purpose Solvent
Oven Cleaner
Paint Thinner
Rubber/Vinyl Protectant

The following narratives address proposed definition additions or changes that require further explanation.

Electronic Cleaners

In the 2004 Amendments to the Consumer Products Regulations, the Board approved a VOC limit of 75 percent by weight for "Electronic Cleaners." At the time the limit was approved, it was determined that the limit was commercially and technologically feasible. As is routinely done, before limits become effective, staff consults with stakeholders to ensure that the limits are technologically feasible. In 2005, several manufacturers indicated that they were encountering problems reformulating certain "Electronic Cleaners" to meet the 75 percent limit. These niche products are those that are used in manufacturing settings where products must be non-flammable, electrically non-conductive, have high dielectric strength, and have a high degree of solvency (Kauri-butanol (Kb) values of 45-55). Kb value is a measure of a compound's ability as a solvent. These attributes would be needed for cleaning

electronic components on a manufacturing line. Industry representatives also indicated that low-toxicity was important in this segment of the market.

Therefore, staff is proposing to exempt certain products from the definition and the 75 percent VOC limit. The label for these certain electronic cleaner products must clearly display the statement: "not for retail sale" and must be sold exclusively to establishments which manufacture or construct goods or commodities. This proposal should ensure that the full range of electronic cleaning products continue to be available to the California market. However, staff will continue to evaluate the need for the exemption as additional technology becomes available. Staff has also determined that approximately 31 of the 106 "Electronic Cleaners" reported in the 2001 Survey would meet the proposed exemption. This reduces the emission reductions claimed from the category in the 2004 Amendments by 0.13 tpd. This small shortfall will be offset by the emission reductions achieved through this rulemaking.

Multi-purpose Solvent

The regulation currently defines "Multi-purpose solvent" as "any organic liquid designed to be used for a variety of purposes, including cleaning or degreasing of a variety of substrates, or thinning, dispersing or dissolving other organic materials. "Multi-purpose Solvent" includes solvents used in institutional facilities, except for laboratory reagents used in analytical, educational, research, scientific or other laboratories. "Multi-purpose Solvent" does not include solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines, or solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment."

This definition was added to the Consumer Products Regulation during the Mid-Term Measures I rulemaking in order to clarify the definition for "Spot Remover." Though not explicitly discussed in the staff reports, the intent of this definition was to characterize those organic solvents that do not necessarily make specific use claims on the principal display panel, such as methyl ethyl ketone (or MEK), denatured alcohol, or mineral spirits. These products are sometimes referred to as "packaged solvents." However, this definition has been interpreted to include solvent-based consumer products that make multiple claims on the label. This is contrary to our original intent.

Examples of removal claims made by these multi-function products include: adhesives, candle wax, bugs, chewing gum, crayon, graffiti, paint, grease, lipstick, marker, oil, ink, scuff marks, and tar. Because many of these removal claims are consistent with those of regulated categories, in the 2004 Amendments, staff committed to analyze these types of products to develop an appropriate regulatory strategy.

In order to conduct this analysis, staff collected data via the 2003 Survey for such categories as "General Purpose Degreaser," "General Purpose Adhesive Removers," "Graffiti Removers," "Spot Removers," "Bug and Tar Removers," "Multi-purpose

Solvent," and "Paint Thinner," as well as undefined categories such as "clean-up solvent" and "lacquer thinner."

Because manufacturers were asked to choose only one primary survey category, multi-function products were reported in a variety of surveyed categories. Staff studied the label claims for the applicable categories and grouped the multi-function products for comparison. Commonly, the principal display panels of multi-function products make two or more removal claims, with additional removal claims listed on secondary display panels. These products are typically composed of approximately 60 percent VOC ingredients, although some products contain 20 percent or less VOC, while some contain nearly 100 percent VOC. Emissions from these products comprise approximately 1.5 tpd of VOC statewide, according to data collected from the 2003 Survey.

One goal of the Consumer Products program is to ensure products use the lowest amount of VOC commercially and technologically feasible. In our analysis of multi-function products, we found no significant differences between individual removal claims on multi-function products and corresponding label claims on single-claim products. The number of compliant products and complying market share within categories with established VOC limits indicate that the current limits are technologically and commercially feasible. Therefore, staff concludes that no special exception in VOC content needs to be made for products that make several claims versus those that make single claims.

To level the playing field, ensure that claimed emissions reductions are achieved, and clarify the intent of the Multi-purpose Solvent definition, staff is proposing to change the definition to read: any liquid product designed to be used for dispersing or dissolving or removing contaminants or other organic materials. "Multi-purpose Solvent" includes (A) products that do not display specific use instructions on the product container or packaging, (B) products that do not specify an end-use function or application on the product container or packaging, and (C) solvents used in institutional facilities, except laboratory reagents used in analytical, educational, research, scientific, or other laboratories. "Multi-purpose Solvent" does not include solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines, or solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment. "Multi-purpose Solvent" also does not include any product making any representation that the product may be used as, or is suitable for use as a consumer product which qualifies under a definition in section 94509(a); such products are not multipurpose solvents and are subject to the "Most Restrictive Limit" provision of section 94512.

The proposed amended definition would include products without specific label claims or specific end-use functions and explicitly includes packaged solvents that are presently marketed without specific label claims. That means, for example, a product labeled only as xylenes, without a specific function or use would be considered a Mult-purpose Solvent. Xylenes labeled as "Paint Thinner" would also not be considered

a Multi-purpose Solvent because the regulation does not include a standard for this category in section 94509. This would also mean that any product that makes claims which qualify the product under a definition in the regulation anywhere on the label, would no longer fit the Multi-purpose Solvent definition. The proposed amended definition still excludes laboratory reagents, solvents used in district-regulated cleaning/degreasing operations, and solvents used exclusively on-site in the manufacture or construction of goods or commodities.

The proposed amended definition will also assist in determining product compliance under the most restrictive limit provision of the regulation.

Staff intends to propose a regulatory standard for Multi-purpose Solvent products in the 2007 rulemaking. While it is not immediately necessary for manufacturers to reformulate or relabel their products, this proposed definition change is intended to clarify the types of products that would be subject to further regulatory action. Staff anticipates that these changes will clarify intent, could achieve significant emission reductions by encouraging consumers to use lower VOC products for specific removal functions, and preserve emissions reductions already claimed.

As part of the multi-function product analysis, staff specifically committed to re-analyze the commercial and technological feasibility of limits for general purpose adhesive remover and graffiti remover proposed in the 2004 amendments. The 2003 survey data support the commercial and technological feasibility claims for limits approved in the 2004 Amendments, as shown in Table V-3. In reviewing the data for the 2003 Survey, reported general purpose adhesive remover and graffiti remover products were categorized as such based on primary label claims. Products for which general purpose adhesive remover and graffiti remover are among multiple primary claims (such as some multi-function products) were not included in this analysis, but could be subject to those limits under the most restrictive limit clause and could therefore influence the figures for the 2003 data in Table V-3 below. Regardless, the types and number of reported products, as well as the complying market share and number of complying products, indicate the limits are achievable as adopted.

Table V-3
Comparison of 2001 Survey Data with 2003 Survey Data

Category	Number of Products/Product Groups		Complying Products/Product Groups		Complying Market Share (%)	
	2001	2003	2001	2003	2001	2003
General Purpose Adhesive Remover	43	57	9	10	42	9
Aerosol Graffiti Remover	35	48	3	9	39	25
Non-aerosol Graffiti Remover	30	45	4	15	11	13

Staff will also contact the manufacturers of the products that do not currently meet the limits for the above listed categories to identify any reformulation issues.

Issues:

1. **Issue:** Some paint thinners make other claims such as project clean-up, degreasing or adhesive removal.

Response: Any product, including paint thinner, must meet the lowest regulated VOC limit according to claims made anywhere on the label, as outlined in the most restrictive limit provision that becomes effective, January 1, 2007. However, unregulated claims, such as chewing gum removal or brush cleaning, can still be made on the label, making it a Multi-purpose solvent. Changes to the "Multi-purpose Solvent" definition are intended to encompass those products with no claims, or label claims that do not fall within a defined category.

2. **Issue:** There is no utility in requiring that manufacturers relabel paint thinners. There is no emissions benefit.

Response: Paint Thinners are not currently regulated, therefore, re-labeling isn't immediately necessary unless the product makes other claims on the label that qualify the product under a regulation definition that has an associated VOC limit. However, we intend to evaluate the feasibility of setting an emission standard for Multi-purpose Solvent for the March 2007 Amendments. If an emission standard were to be adopted, then a Paint Thinner manufacturer may choose to label the product consistent with the regulatory definition at the time the Multi-purpose Solvent limit became effective.

Nail Polish Remover

The Nail Polish Remover (NPR) category consists of products which are designed and labeled primarily for the purpose of removing nail polish or other nail coatings from the surface of fingernails and toenails. These products generally consist of a solvent or mixture of solvents which act to dissolve the nitrocellulose present in nail polish. Depending upon formulation, nail polish removers may have a secondary function of removing artificial nails, wraps, and tips. Nail Polish Removers were first regulated under "Phase I" of the Consumer Products Regulation adopted in October of 1990.

Under "Midterm II" of the Consumer Products Regulation adopted in October of 1999, a VOC limit of zero percent by weight for NPR became effective in December 2004. Many existing formulations that are compliant with this standard are comprised of acetone, an exempt solvent. Yet, a significant market exists for non-acetone products because acetone may damage artificial nails. The traditional solvent for non-acetone formulations is ethyl acetate, a VOC.

In order to meet the NPR VOC standard, as well as market demand, some manufacturers attempted to reformulate using the exempt solvent methyl acetate. Methyl acetate was suggested as a possible non-acetone reformulation option in the Initial Statement of Reasons in the Midterm II regulatory amendments when the zero percent standard was originally adopted. In October 2004, two major NPR manufacturers approached staff to discuss difficulties they had encountered with reformulated non-acetone based NPR products. The manufacturers encountered two issues resulting from the use of methyl acetate. First, a small amount of VOC impurities exist in the raw materials, up to 0.5 percent, even in the purest grade of methyl acetate. Second, methyl acetate, when in contact with water, undergoes a chemical reaction that yields methanol and acetic acid (both VOCs) as products, which continues even after the product is packaged. Over the course of conducting accelerated aging and stability testing of new formulations, the manufacturers discovered the reaction occurs at various compositions of methyl acetate, even with additives to minimize the reaction (such as pH buffers). They estimate the reaction can form approximately one percent VOC within one year after manufacture. With the adopted limit of zero percent VOC in place, these methyl acetate-based NPR products could conceivably be subject to enforcement action, despite being formulated and manufactured in good faith and distributed in a timely fashion.

To accommodate these unavoidable circumstances, staff proposes raising the NPR VOC limit to one percent by weight, to become effective December 31, 2007. Manufacturers have indicated that a one percent VOC level is achievable by using high-grade methyl acetate (which contains the lowest levels of methanol contamination) and the inclusion of additives to minimize VOC formation over time. Raising the limit amounts to an emission reduction shortfall of 0.04 ton per day, which will be offset by emission reductions resulting from the current regulatory amendments.

Rubber and Vinyl Protectant

Background

ARB staff is proposing definition changes pertaining to the current "Rubber and Vinyl Protectant" and "Fabric Protectant" categories. There is no proposal at the present time to change the VOC limit for either category. However, staff may consider a revision of the VOC limit for "Fabric Protectants" as part of the March 2007 amendments. At the present time, ARB staff is also proposing related changes to the exemptions in the Aerosol Coatings Regulation. We believe that the proposed modifications, as discussed below, are needed to clarify the regulations, to preserve emission reductions claimed in past rulemakings, and to maintain a level playing field for those products that sometime ago reformulated to meet certain VOC limits. The proposed definition changes would become effective December 31, 2008.

For "Rubber and Vinyl Protectants," the consumer products survey for calendar year 2003 had required reporting only for the non-aerosol products. Reporting for the aerosol products was deferred to the next regulatory cycle (for calendar year 2005 or

2006), anticipated to begin toward the end of 2006. However, staff decided to move the definition change proposal (applicable to all product forms) forward and added it to the current proposal package to expedite urgently needed clarifications. To accomplish this, during summer 2006, staff requested marketers to early-submit survey data for aerosol products for sales year 2005. The 2005 survey data provided information toward developing the current definition change proposal. Since the aerosol products had been scheduled for review during the next regulatory cycle (after the March 2007 amendments), staff may at that time consider changes to the VOC limit for the aerosol products.

"Rubber and Vinyl Protectants" are products used to protect, preserve, or renew vinyl, rubber, and plastic on vehicles, tires, luggage, furniture, and other household items. The category includes tire cleaners that leave an appearance-enhancing or protective substance on the tire, but does not include other tire cleaners. Typical products include tire shine, protectants for automotive interior plastic and vinyl, and protectants for exterior automotive rubber/plastic bumpers and trim. The "Rubber and Vinyl Protectant" category does not include products primarily used to clean the wheel rim, such as aluminum or magnesium wheel cleaners.

"Rubber and Vinyl Protectant" products were regulated under "Mid-term Measures I" of the Consumer Products Regulation adopted July 24, 1997, and a description of those products is included in the staff report for that item (ARB, 1997). At that time, the Board adopted a 10 percent VOC limit for aerosol products, effective January 1, 2005, and a 3 percent VOC limit for non-aerosol products, effective January 1, 2003.

"Fabric Protectants" were regulated under "Phase II" of the Consumer Products Regulation adopted January 1992, and a description of those products is included in the staff report for that item (ARB, 1991b). At that time, the Board adopted as staff had recommended, a 75 percent VOC limit for all product forms effective January 1, 1995, along with a 60 percent VOC limit for all product forms subsequently effective January 1, 1997. The 60 percent VOC limit remains effective to this day. As indicated above, staff may propose a revision to the "Fabric Protectant" VOC limit, as part of the March 2007 amendments.

Overlap Between Consumer Products Regulation and Aerosol Coatings Regulation

Historically, "Rubber and Vinyl Protectants" and "Fabric Protectants" have been specifically regulated within the "Consumer Products Regulation." However with many products, there is a regulatory overlap with certain requirements in the Aerosol Coatings Regulation, which is primarily applicable to aerosol spray paint. The Aerosol Coatings Regulation includes a category of "vinyl/fabric/leather/polycarbonate coatings." This category applies to aerosol coating products used for certain plastic substrates (vinyl or polycarbonate), or for fabric substrates. The current regulatory standard for "vinyl/fabric/leather/polycarbonate coatings" is 1.55 PWMIR (product-weighted

maximum incremental reactivity), effective January 1, 2003. The Aerosol Coatings Regulation was not designed or developed with the intention of regulating "Rubber and Vinyl Protectants" or for "Fabric Protectants."

The Aerosol Coatings Regulation defines "Aerosol Coating Product" to mean "a pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, and is packaged in a disposable can for hand-held application ... " This definition may be interpreted to include many of the "Rubber and Vinyl Protectant" and "Fabric Protectant" products, since they protect substrates by leaving a film (i.e. coating) on the surface, and the products are applied by hand-held aerosol spray containers that are disposable. With the regulatory overlap, there is confusion concerning which regulation (or both) applies.

To avoid the overlap and the two sets of compliance requirements for industry, ARB staff is proposing changes in the two regulations to clarify that certain overlap products are regulated solely within the Consumer Products Regulation, as presently considered by ARB staff and most product marketers, while other products are regulated solely within the Aerosol Coatings Regulation. To accomplish this, products that meet either the proposed "Rubber/Vinyl Protectant" definition or the proposed "Fabric Protectant" definition in the Consumer Products Regulation would be regulated as such, and would be explicitly excluded from the Aerosol Coatings Regulation.

In addition, to clarify that cosmetics and other products used on the human body are also regulated solely within the Consumer Products Regulation, as presently considered by ARB staff and most product marketers, those products would also be explicitly excluded from the Aerosol Coatings Regulation. Likewise, this clarification would pertain to personal care aerosol products containing pigment or resin, and dispensed by hand-held disposable containers.

Any Combination of Substrates

While the definition used the word "and" in "Rubber and Vinyl Protectant," ARB staff had always considered this to mean "and/or" rubber/vinyl, and that the category included products for: 1) both "rubber and vinyl," 2) for "rubber only," and 3) for "vinyl only." Because of the definition drafting error, it was unclear that products such as tire protectants which only protected rubber surfaces, rather than rubber and vinyl surfaces, qualify as "Rubber and Vinyl Protectants." Also, the definition had always included products used to protect plastic substrates (e.g. hard plastics), although the category name was simply "Rubber and Vinyl Protectant." When considering what products are included in the category, we believe that most marketers had been consistent with the ARB staff interpretation. With increasing market competition products such as "tire shine" used for rubber only, the "and/or" issue has become problematic. To clarify the definition, ARB staff is proposing revisions using the word "or," and using the slash "/."

Proposed Definition Changes

The propose changes are shown below.

Consumer Products Regulation, section 94508. Definitions

(1213) "Rubber ~~and~~ /Vinyl Protectant" means:

(A) for products manufactured before December 31, 2008: any product designed to protect, preserve or renew vinyl, rubber, and plastic on vehicles, tires, luggage, furniture, and household products such as vinyl covers, clothing, and accessories. "Rubber ~~and~~ /Vinyl Protectant" does not include products primarily designed to clean the wheel rim, such as aluminum or magnesium wheel cleaners, and tire cleaners that do not leave an appearance-enhancing or protective substance on the tire.

(B) for products manufactured on or after December 31, 2008: any product designed or labeled to protect, preserve or renew vinyl, or rubber on vehicles, tires, luggage, furniture, and/or household products such as vinyl covers, clothing, or accessories. "Rubber/Vinyl Protectant" does not include: products primarily labeled to clean the wheel rim, such as aluminum or magnesium wheel cleaners; tire cleaners that do not leave an appearance-enhancing or protective substance on the tire; pigmented products used primarily for coloring; translucent-film-forming products used in conjunction with pigmented products; and other film-forming products used for construction, reconstruction, modification, structural maintenance or repair of rubber or vinyl substrates, or products qualifying as Vinyl/Fabric/Leather/Polycarbonate Coating under section 94521(a).

(51) "Fabric Protectant" means:

(A) for products manufactured before December 31, 2008: a product designed to be applied to fabric substrates to protect the surface from soiling from dirt and other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include waterproofers, products designed for use solely on leather, or products designed for use solely on fabrics which are labeled "for dry clean only" and sold in containers of 10 fluid ounces or less.

(B) for products manufactured on or after December 31, 2008: a product designed or labeled to be applied to fabric substrates to protect the surface from soiling from dirt or other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include waterproofers or products designed for use solely on leather. Fabric

Protectant" does not include pigmented products used primarily for coloring, translucent-film-forming products used in conjunction with pigmented products, and other film forming products used for construction, reconstruction, modification, structural maintenance or repair of fabric substrates, or products qualifying as Vinyl/Fabric/Leather/Polycarbonate Coating under section 94521(a).

Aerosol Coatings Regulation, section 94523. Exemptions

a) i) for products manufactured before December 31, 2008: This article shall not apply to aerosol lubricants, mold releases, automotive underbody coatings, electrical coatings, cleaners, belt dressings, anti-static sprays, layout fluids and removers, adhesives, maskants, rust converters, dyes, inks, cosmetics or any other products used on the human body, and leather preservatives or cleaners.

ii) for products manufactured on or after December 31, 2008: This article shall not apply to aerosol lubricants, mold releases, automotive underbody coatings, electrical coatings, cleaners, belt dressings, anti-static sprays, layout fluids and removers, adhesives, maskants, rust converters, dyes, inks, cosmetics or any other products used on the human body, leather preservatives or cleaners, "Rubber/Vinyl Protectants" as defined in section 94508, and "Fabric Protectants" as defined in section 94508.

Effect of Proposed Definition Changes

The proposed definitions for "Rubber/Vinyl Protectant" and "Fabric Protectant" each includes a proposed exclusion for "Vinyl/Fabric/Leather/Polycarbonate Coating" products. However, the definition of "Vinyl/Fabric/Leather/Polycarbonate Coating" specifies that a coating must be exclusively for these substrates to qualify as an excluded product. For example, if a product is labeled for vinyl and fabric substrates only, it would qualify as a "Vinyl/Fabric/Leather/Polycarbonate Coating" and is thus excluded from the "Rubber/Vinyl Protectant" category and thus also excluded from the "Fabric Protectant" category. However, if a product is labeled for any other non-specified substrate (e.g. for rubber or for plastic-- which includes hard plastic and non-vinyl plastic other than polycarbonate), that would make the product ineligible as "Vinyl/Fabric/Leather/Polycarbonate Coating." Therefore, such a product for rubber, would be a "Rubber/Vinyl Protectant" if it meets the remainder of the "Rubber/Vinyl Protectant" definition. Such a product for fabric would be a "Fabric Protectant" if it meets the remainder of the "Fabric Protectant" definition.

Tire protectant/coating/shine products (i.e. for rubber) (other than products that are solely tire cleaners) would be "Rubber/Vinyl Protectant."

All products for "vinyl" (e.g. for car interiors) would be "Rubber/Vinyl Protectant." The word "plastic" would make these products ineligible for the "Vinyl/Fabric/Leather/Polycarbonate Coating" exclusion, and therefore they would be in the category "Rubber/Vinyl Protectant."

An aerosol coating (either clear or pigmented) for rubber and vinyl, which is currently considered a "clear coating," a "nonflat coating," or a "flat coating," (not qualifying as "Vinyl/Fabric/Leather/Polycarbonate Coating" because of other substrates such as rubber, metal, wood), would be subject to the "Rubber/Vinyl Protectant" limit in the Consumer Products Regulation. These products may avoid this overlap by removing the word, "rubber," from the label.

A product for protecting fabric that may be labeled for vinyl/leather/polycarbonate as well would be excluded from the "Fabric Protectant" category. These products would be "Vinyl/Fabric/Leather/Polycarbonate Coating" products in the Aerosol Coatings Regulation.

Issues:

1. **Issue:** Products continually change, sometimes innovatively, to meet consumer preference. The regulatory language needs to clearly place a product into either the Consumer Products Regulation or the Aerosol Coatings Regulation. The Rubber/Vinyl Protectants have changed substantially. There are now more products with multiple claims for cleaning, shining, and protecting. Also, some "tire dressings" have evolved into longer-durability "tire coatings," which are more appropriately classified under the aerosol coatings regulation. There should not be any most-restrictive-limit requirement between the consumer products and aerosol coating regulations.

Response: Where there is confusion, we are proposing to clarify that certain affected products are regulated by the Consumer Products Regulation and others by the Aerosol Coatings Regulation. With this clarification, there will not be a most restrictive limit issue. We understand that products are improved over time, and some are now more durable than in the past. However, in the case of tire dressings or coatings we believe that the Consumer Products Regulation is still the more pertinent regulation for most affected products. These products were clearly intended to be regulated in the Rubber and Vinyl Protectant category of the Consumer Products Regulation as demonstrated in the staff report done for the initial rulemaking.

2. **Issue:** Any proposed definition should not include additional products. If the compliance status of current products is to be affected, sufficient data should exist to determine the feasibility and impacts of regulatory change.

Response: The proposed definitions should not include additional products, although there may be questions about which regulation had applied to particular products. We expect that feasibility and impacts of the regulatory change are not substantial issues. We will work with industry on a case-by-case basis to resolve specific compliance issues.

3. **Issue:** Industry would accept an ARB determination that aerosol rubber/vinyl protectant should be subject to limits in the Aerosol Coatings Regulation. Time may be needed to allow companies to assure compliance with appropriate formulations and labels. We are also willing to similarly consider fabric protectants. However, no consumer product should be subject to both regulations and the most-restrictive limit. The two regulations should be mutually exclusive regarding which one applies to a particular product.

Response: See responses to 1 and 2 above. Regarding compliance with appropriate formulations and labels, we will work with industry on a case-by-case basis to identify and resolve specific issues.

4. **Issue:** Some specialty coatings (aerosol paint products) are used for repair of automotive interior parts with vinyl and plastic surfaces. The word "coat" would eliminate these products, since they would not be able to comply with the VOC limits. The word "coat" should be removed.

Response: We have deleted the word "coat," and have added other changes to address this issue in the proposed definitions above. Products used solely for vinyl would be in the Aerosol Coatings Regulation. Products used for both vinyl and plastic, and for rubber, vinyl, and plastic would be subject to the Consumer Products Regulation.

B. STANDARDS FOR CONSUMER PRODUCTS (SECTION 94509)

Table of Standards

The proposed regulatory action would amend the existing consumer products regulation by adding product category definitions and VOC limits for three new categories, and by adding more stringent VOC limits for 12 existing categories. The new or modified VOC limits would become effective on either December 31, 2008 or December 31, 2010, as indicated in Table V-5 below. These changes would be reflected in the Table of Standards in Section 94509.

Table V-4
Proposed VOC Limit, Product Forms, and Effective Dates

Product Category	Product Form	Proposed VOC Limit (wt%)	Effective Date
Automotive Windshield Washer Fluid (Type "A" Areas)	All	25	12/31/08
Bathroom and Tile Cleaner	Non-aerosol	1	12/31/08
Brake Cleaner	All	10	12/31/08
Carburetor or Fuel-Injection Air Intake Cleaner	All	10	12/31/08
Construction, Panel, and Floor Covering Adhesive	All	7	12/31/08
Disinfectant	Aerosol	70	12/31/08
	Non-aerosol	1	12/31/08
Engine Degreaser	Aerosol	10	12/31/08
Floor Polish or Wax (for resilient flooring material)	All	1	12/31/10
Floor Polish or Wax (for nonresilient flooring material)	All	1	12/31/10
Furniture Maintenance Product	Non-aerosol	3	12/31/08
General Purpose Cleaner	Aerosol	8	12/31/08
General Purpose Degreaser	Aerosol	10	12/31/08
Laundry Starch/Sizing/Fabric Finish Product	All	4.5	12/31/08
Oven Cleaner	Non-aerosol	1	12/31/08
Sanitizer	Aerosol	70	12/31/08
	Non-aerosol	1	12/31/08
Temporary Hair Color	Aerosol	55	12/31/10

Other Sections of 94509

Prohibition of Toxics from Specific Categories

We are proposing to prohibit the use of methylene chloride, perchloroethylene and trichloroethylene in "Construction, Panel, and Floor Covering Adhesive," "Oven Cleaners," "General Purpose Cleaners," and "Bathroom and Tile Cleaners." The 2003 Survey found a "Construction, Panel and Floor Covering Adhesive" product containing methylene chloride. However, it is our understanding the product has been discontinued. In addition, an oven and grill cleaning product, closely related to, but not included in the oven cleaner category, was found to also contain methylene chloride. It

is also possible that chlorinated solvents could be included in reformulated "General Purpose Cleaners" and "Bathroom and Tile Cleaners."

Under the California Environmental Quality Act, ARB is required to identify and mitigate any possible adverse environmental impacts of regulatory actions. We believe that it is unlikely, but possible, that manufacturers may, in response to new VOC limits, choose to reformulate with chlorinated solvents in these categories. Therefore, because there are many products that comply with the proposed limits, none of which contain chlorinated solvents, we thought it prudent to prohibit their use.

Proposed Amendments to the Aerosol Coatings Regulation

A. EXEMPTIONS (SECTION 94523)

To avoid overlap, and two sets of compliance requirements for industry, ARB staff is proposing changes in the Aerosol Coatings Regulation to clarify that certain products are regulated solely within the Consumer Products Regulation, as presently considered by ARB staff and most product marketers. To accomplish this, products that meet either the proposed "Rubber/Vinyl Protectant" definition or the "Fabric Protectant" definition in the Consumer Products Regulation would be regulated as such, and would be explicitly excluded from the Aerosol Coatings Regulation.

In addition, to clarify that cosmetics and other products used on the human body are also regulated solely within the Consumer Products Regulation, as presently considered by ARB staff and most product marketers, those products would also be explicitly excluded from the Aerosol Coatings Regulation. Likewise, this clarification would pertain to personal care aerosol products containing pigment or resin, and dispensed by hand-held disposable containers.

REFERENCES

1. Air Resources Board, Technical Support Document. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation. September 10, 1999. *("Mid-term Measures II")*. (ARB, 1999)

2. Air Resources Board, Technical Support Document. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation. June 6, 1997. *("Mid-term Measures I")*. (ARB, 1997)

3. Air Resources Board, Technical Support Document. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991)

4. Air Resources Board, Technical Support Document. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products. August, 1990. (ARB, 1990)

VI.

DESCRIPTION OF PRODUCT CATEGORIES

A. Automotive Windshield Washer Fluid (Type "A" Areas)

Product Category Description:

Automotive windshield washer fluids are liquids designed or labeled for use in motor vehicle windshield washer fluid systems either as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield. Some products also claim to add a coating to the windshield that repels water, bugs, dirt, and grime. "Automotive Windshield Washer Fluid" does not include any fluid which is placed in the windshield washer reservoir of new motor vehicles at the time the vehicle is manufactured. Dilutable automotive windshield washer fluids are sold either in a container with a capacity of 55 gallons or more or a container with a capacity of one quart or less. Pre-mixed automotive windshield washer fluids are sold in a container with a capacity that is greater than one quart but less than 55 gallons.

Automotive windshield washer fluids are sold as both ready-to-use (pre-mixed) products and dilutable concentrates (dilutables). The pre-mixed products make up the vast majority of the market and are generally sold in one gallon jugs. Pre-mixed products, are intended to be poured directly into the fluid reservoir without any additional dilution or mixing. On the other hand, dilutable concentrates allow consumers to mix the concentrated windshield washer fluid with water to the specified concentration in a separate container or the washer fluid reservoir. These dilutable products are generally sold in sizes of one quart or less, although a few dilutable products are currently sold in half or one gallon containers.

Automotive windshield washer fluids are regulated based on the areas of California they would be used in: Type "A" areas and all other areas. Type "A" areas are regions of the State which experience colder temperatures and require a higher VOC content to prevent freezing of the fluid in the washer fluid reservoir. Specifically, Type "A" areas include only the following regions of California: Del Norte, Shasta and Trinity Counties; the Great Basin Valley, Lake Tahoe, Mountain Counties, and Northeast Plateau Air Basins, as defined in title 17, California Code of Regulations, sections 60105, 60108, 60111, and 60113.

Automotive windshield washer fluids (Type "A" areas) were regulated under "Phase I" of the consumer products regulation adopted in October of 1990, and a description of these products is also included in the staff report for that item (ARB, 1990). At that time, the Board adopted a 35 percent VOC limit for these products which was effective on January 1, 1993.

Table VI-1 below summarizes the sales and emissions from automotive windshield washer fluids in Type "A" areas based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-1, 38 Automotive Windshield Washer Fluids (Type "A" areas) were reported in the survey with estimated VOC emissions of about 1.68 tpd (3,352 pounds per day) in California.

Table VI-1
Automotive Windshield Washer Fluids (Type "A" Areas)*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
All forms	38	10,982	3,352

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

Automotive windshield washer fluids can be split into two fluid types: Generic "blue fluid" with limited freeze protection and De-Icer fluids, which are necessary in areas that require freeze protection. Type "A" areas require De-Icer fluids. De-Icer fluids perform 3 functions: maintenance of adequate freeze protection in the vehicle reservoirs and fluid lines, melt and remove ice, frost and snow from windshields on initial startup, and elimination of ice and snow buildup and maintenance of visibility while driving. Data show that certain areas of California can get as low as -32 degrees Fahrenheit in January very often (Honeywell CPG-Prestone, 2006). Although temperatures are unlikely to get that low, it is important that products are available in these areas to provide the necessary amount of freeze protection.

Automotive windshield washer fluids (Type "A" areas) are sold in auto parts stores, gas stations, car dealerships, hardware stores, grocery supermarkets, convenience stores and in mass-merchandisers. Automotive windshield washer fluids are periodically added to the vehicle reservoir by the "do-it-yourself" customer or by a technician at an automotive repair facility, as needed. A small pump moves the fluid through tubing until it is squirted onto the windshield(s) through orifices at the base of the front windshield and the top of the rear windshield (if applicable). Automotive windshield washer fluid can also be routed through separate tubing and sprayed onto the headlights of some newer vehicles to remove dirt and insects from the headlight lenses.

Requiring the physical "squeegee" action of the wiper blades, automotive windshield washer fluids remove ice, dirt, bugs, dust and other contaminants from the windshield. Drivers typically squirt these products onto their vehicle windshield when they first start the vehicle to remove ice or accumulated dust. They may also be applied while driving to remove bugs or other contaminants that contact the windshield when the vehicle is moving.

Product Formulation:

Automotive windshield washer fluids (Type A areas) are composed of water and a mixture of VOC and LVP-VOC ingredients, as well as inorganics, with the VOCs composed mainly of alcohols and glycol ethers. The VOCs in windshield washer fluids serve several purposes. First, in Type A areas, the VOCs typically serve as freeze-point depressors. VOCs can also serve as growth inhibitors, which is an important function for preventing mold and algae growth in the reservoir and tubing of the windshield washer system. However, several glycol ethers would serve this same function and several would qualify as exempt LVP-VOCs.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Automotive Windshield Washer Fluid (Type A areas), is 25 percent by weight, effective December 31, 2008. As shown in Table VI-2, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 620 pounds per day or 0.31 tons per day.

Table VI-2 also shows that 12 products, representing 17 percent of the market currently comply with the proposed 25 percent by weight VOC limit.

Table VI-2
Automotive Windshield Washer Fluid (Type A Areas) Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
All forms	25	12	17	620

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Manufacturers should be able to meet the proposed 25 percent VOC limit by reformulating their existing product with LVP-VOC and inorganic substitutes. This limit allows for products to maintain both their freeze-point stability and overall product effectiveness. As an example, manufacturers may meet the proposed limit by replacing the level of alcohol with more water or LVP-VOC glycol ethers.

Issue:

1. **Issue:** The proposed VOC limit of 25 percent for Automotive Windshield Washer Fluid is the lowest that will allow adequate freeze protection and visibility in rainy weather in Type "A" areas.

Response: ARB staff agrees with this comment and have proposed a VOC limit of 25 percent by weight.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September, 10, 1999. (ARB, 1999)

3. Air Resources Board, Staff Report. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products: Phase I. August, 1990. (ARB, 1990a)

4. Air Resources Board, Technical Support Document. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products: Phase I. August, 1990. (ARB, 1990b)

5. Air Resources Board, Final Statement of Reasons for Rulemaking, Including Summary of Comments and Agency Responses: Public Hearing to Consider the Adoption of a Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products. October, 1990. (ARB, 1990c)

6. CSPA Automotive and Solvent Products. Technical Seminar for CARB Staff. July 13, 2006. (Honeywell CPG-Prestone, 2006)

B. Bathroom and Tile Cleaners (non-aerosol)

Product Category Description:

Bathroom and tile cleaners are specialty cleaning products designed and specifically labeled to clean a variety of household and commercial bath or restroom surfaces. Included in this category are both all-purpose / multi-surface bathroom cleaners and hard surface bathroom cleaners. Products labeled primarily to clean the surfaces inside toilet bowls or urinals are excluded from this category.

Bathroom and tile cleaners include products that remove mold and mildew stains, rust stains, scale due to water hardness, and products that make disinfecting claims.

Bathroom and tile cleaners are packaged in both aerosol and non-aerosol forms and were initially regulated under "Phase I" of the Consumer Products Regulation in 1990. At that time, the Board adopted a 7 percent by weight VOC limit for aerosols and a 5 percent by weight VOC limit for all other forms. The effective date for these limits was January 1, 1994. We believe technology now exists to further reduce the VOC content limit for non-aerosol Bathroom and Tile Cleaners.

Table VI-3 below summarizes the sales and emissions from non-aerosol bathroom and tile cleaners based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-3, non-aerosol bathroom and tile cleaners have estimated VOC emissions of about 0.4 tpd (802 pounds per day) in California.

Table VI-3
Bathroom and Tile Cleaner (non-aerosol)*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Non-aerosol	337	90,992	802

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

As shown in Table VI-3, this category contains 337 products with sales of about 91,000 pounds per day. The sales-weighted average VOC content is about one percent.

Product Use and Marketing:

Non-aerosol bathroom and tile cleaners are used on tile, porcelain, and other hard surfaces such as toilet fixtures, sinks, tubs, and shower stalls. Non-aerosol bathroom and tile cleaners include products or product forms which do not use a pressurized spray system to dispense product ingredients by means of a propellant contained in a product or a product's container.

These products can be purchased through many sales outlets including grocery stores, discount stores, wholesalers, mass merchandisers, hardware stores, warehouse stores, and home centers. Bathroom and tile cleaners are also sold to industrial or institutional users through distributors or through direct sales by the manufacturer.

Examples of non-aerosol product forms include "wipes," pump sprays, pastes, ready-to-use liquids, and liquid concentrates. These products are typically applied using a trigger pump spray, mop and bucket, or wiped on with a sponge, cloth, or "wipe/towelette." Depending on the substrate, the product may or may not need to be rinsed off. To prevent excessively fast run-off of the cleaning product, some pump spray products use special nozzles that mechanically mix and dispense the product as "foam." These specialty products are formulated to remove not only normal soils found on bathroom surfaces, but also hard water deposits, soap scum, rust stains and discolorations due to mold growth.

Product Formulation:

Bathroom and tile cleaners are primarily designed for cleaning the stains and soils due to moisture and water hardness. Bathroom cleaners designed for general

surface cleaning may contain VOC ingredients such as 2-butoxyethanol, isopropyl alcohol, or pine oil. However, these products primarily contain surfactants to penetrate and loosen the soil. In addition, they may contain sequestering agents and specific solvents to dissolve and keep calcium (hardness) deposits, soap scum and rust stains in solution until being rinsed or wiped off. Products that remove mold or mildew stains may also contain an oxidant such as sodium hypochlorite, antimicrobial agents to attack mold and mildew, and alkaline ingredients such as sodium carbonate, sodium silicate or sodium hydroxide. Depending on the soil, some cleaners which target soap scum or water hardness deposits may also contain acids such as hydroxyacetic or sulfamic acids.

Proposed VOC Limit and Compliance:

The proposed VOC limit for bathroom and tile cleaner is 1 percent by weight, effective December 31, 2008. As shown in Table VI-4, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 260 pounds per day or 0.13 tpd.

Table VI-4 also shows that over 80 percent of the market currently complies with the proposed 1 percent by weight VOC limit.

Table VI-4
Bathroom and Tile Cleaners (non-aerosol) Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Non-Aerosol	1	264	81	260

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

The proposed 1 percent VOC limit is designed to further reduce VOC emissions from non-aerosol bathroom and tile cleaners. We anticipate that manufacturers of non-complying products will reformulate using LVP-VOC glycol ethers, inorganic salts, and/or a mild, non-VOC acid such as glycolic acid.

REFERENCE

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

C. Brake Cleaners

Product Category Description:

Brake cleaners are defined in the Consumer Products Regulation as products designed or labeled to remove oil, grease, brake fluid, brake pad material, and dirt from motor vehicle brake mechanisms. These products are sometimes also labeled for use in cleaning dirt or grease from other motor vehicle parts.

The VOC limit for automotive brake cleaners was last amended under the Midterm II Amendments to the Consumer Products Regulation adopted in October of 1999, and a description of these products is also included in the staff report for that item (ARB, 1999). At that time, the Board adopted a 45 percent VOC limit for these products, effective January 1, 2003. On April 27, 2000, ARB adopted the Airborne Toxics Control Measure (ATCM) for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities (AMR). This ATCM prohibited Brake Cleaners from containing the chlorinated compounds perchloroethylene, methylene chloride, and trichloroethylene, effective December 31, 2002 (ARB, 2000).

Table VI-5 below summarizes the sales and emissions from brake cleaners based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-5, Brake Cleaners have estimated VOC emissions of about 4.84 tpd (9,680 pounds per day) in California. Brake Cleaners are sold in both the aerosol and liquid forms, with the aerosol form dominating the market in both sales and emissions.

Table VI-5
Brake Cleaner*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
All Forms	112	23,016	9,680

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

Brake cleaners are used by both "do-it-yourself" and professional mechanics. These products are used on both disc and drum brake components such as drums, rotors, brake cylinders, linings, and springs.

Aerosol brake cleaners are typically sprayed on the entire brake assembly prior to repairs to remove dirt, oil, grease, or other contaminants. However, some manufacturers recommend that their products not be used on rubber parts and brake pads or linings. Brake cleaners are also used on individual components after

disassembly, often to remove greasy fingerprints or other contaminants from friction surfaces.

Liquid brake cleaners are used primarily by mechanics. When using these products, mechanics disassemble brake components and immerse them in the liquid product for several minutes or longer. These types of products may be used repeatedly until they become too dirty and must be replenished.

Some liquid products are water-based formulations and are used in portable "bird-bath" brake cleaning systems. These systems generally consist of a reservoir of the cleaning solution with a collection pan on top and a nozzle and brush. Mechanics typically spray down the entire brake assembly with these systems and use the brush as necessary to clean the brake components. The dirty solution drips off the brake assembly and is collected in the pan and routed into the reservoir which may be filtered or skimmed to remove brake dust and oil, extending the life of the cleaning solution.

Brake cleaners are sold primarily in auto parts stores, hardware stores, and by mass merchandisers. Manufacturers or distributors may also sell these products directly to large customers such as auto repair facilities, car dealerships, and companies that maintain their own vehicle fleets (ARB, 1999).

Product Formulation:

Brake cleaners are typically composed of organic solvents designed to remove grease, oil, and other contaminants from brake parts. These include acetone, toluene, methanol, heptane, and xylene. Many of these also have VOC exempt solvents such as acetone. Aerosols usually contain a propellant such as carbon dioxide or propane. There are also low and near-zero VOC water-based products. Water-based products generally use glycol ethers such as propylene glycol t-butyl ether but may also contain aromatic solvents, inorganics, alcohols and exempt solvents like acetone.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Brake Cleaner is 10 percent by weight, effective December 31, 2008. As shown in Table VI-6, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 7,400 pounds per day or 3.7 tons per day.

Table VI-6 also shows that 5 percent of the market currently complies with the proposed 10 percent VOC limit. The complying market share includes aerosol and non-aerosol products with non-aerosol products making up the majority of the market share. However, of the 21 complying products, more are aerosol products than are non-aerosol.

Table VI-6
Brake Cleaner Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
All Forms	10	21	5.1	7,400

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

The 10 percent by weight VOC limit is proposed based on staff's review of existing or new technologies and on results of a research project funded by ARB. The goal of the research was to develop low VOC and non-toxic aerosol maintenance products.

In 2003, the Institute for Research and Technical Assistance (IRTA) with assistance from a Technical Review Committee (TRC) undertook a project to develop low VOC and low toxic automotive maintenance products. The TRC consisted of government agencies, environmental organizations, automotive repair shops and facilities, product formulators and manufacturers. Working with the TRC, IRTA was able to demonstrate effective aerosol automotive maintenance products, including brake cleaners. The products were used by technicians at several automotive maintenance facilities. Under these "real world" scenarios the technicians found the products to perform as well, or nearly as well as, existing solvent-based products (IRTA, 2004).

The IRTA Study was reviewed and approved by the Research Screening Committee. The Board's legislatively mandated Research Screening Committee consists of scientists, engineers, and others knowledgeable, technically qualified, and experienced in air pollution problems. The Committee meets approximately four times a year to review proposed and completed research projects (IRTA, 2004).

The products that performed well had no more than 10 percent VOC by weight. Products that were effective were based on the following technologies: LVP-VOC, alkaline cleaning, surfactant, or exempt VOC solvents. Typical propellants that were effective at delivering the products were hydrocarbons or carbon dioxide. To meet the proposed 10 percent VOC limit, we expect products to use these technologies (IRTA, 2004).

Other reformulation options that could be used by manufacturers to meet the proposed limit include the use of more acetone as well as exempt propellants. Staff also believes that the water-based technology currently used in "bird-bath" cleaning systems can be transferred to the aerosol form. This has been shown by current products on the market, in California, with similar technology that do meet the proposed limit (Kyzen, 2006). Staff believes these options provide a viable and technically feasible way for the industry to create effective products at the proposed VOC limit

without the use of high VOC or toxic compound formulations. Products would be either water-based or solvent-based using LVP-VOCs or exempt VOC solvents.

Issues:

1. **Issue:** The proposed VOC limit for Brake Cleaner is not technologically or commercially feasible due to issues such as dry time and efficacy.

Response: Survey data show that there are products currently able to meet the limit. As explained in the "Proposed VOC limit and Compliance" section, ARB contracted with IRTA to show that nontoxic, low VOC alternatives can be formulated at the proposed limit and perform comparably to existing products.

2. **Issue:** ARB staff should not use the IRTA study as proof of low VOC capability because the study is flawed in concept and execution.

Response: ARB staff disagrees with the comment. The draft final report was reviewed and approved by ARB's Research Scientific Committee, a panel of independent distinguished scientists. In addition to results from the IRTA study, we note that 5 percent of the market currently complies with the proposed limit. The field study conducted by IRTA, at automotive repair facilities, represents real-world scenarios. ARB staff is also aware of products recently introduced to the market, and other products soon to be introduced to the market, that already comply with the proposed 10 percent VOC standard (Kyzen, 2006).

3. **Issue:** The proposed limits will cause consumers and institutional users to use gasoline or other packaged solvents.

Response: This is unlikely because most institutional facilities such as auto maintenance and repair are under air district permit. Use of gasoline or other solvents would be a violation of permits and local district rules. We also note that products effectively perform at the proposed limit so there is no incentive to switch in this manner.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board. Final Statement of Reasons, Public Hearing to Consider the Airborne Toxics Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities. August 27, 2000. (ARB, 2000)

3. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September 10, 1999. (ARB, 1999)

4. Institute for Research and Technical Assistance (IRTA). Safer Alternatives to Solvent Aerosol Automotive Products. December, 2004. (IRTA, 2004)

5. Kyzen Corporation. Product Bulletin: Kyzen Cyber Solv. September, 2006. (Kyzen, 2006)

D. Carburetor or Fuel-Injection Air Intake Cleaners

Product Category Description:

Carburetor or fuel-injection air intake cleaners are designed to remove fuel deposits, oil, dirt, and other contaminants from carburetors, chokes, and associated linkages, or the air intake systems of fuel injected vehicles. These products are sometimes also labeled to remove deposits from fuel injectors, engine intake valves, and the combustion chamber. However, these deposits are more commonly removed by products designed to be introduced directly into the fuel lines or added to the fuel storage tank. These products are excluded from the definition. In this rulemaking, we are proposing a clarifying amendment to the existing definition that would exclude products designed exclusively to be introduced directly into vacuum lines during engine operation.

Removal of fuel deposits is necessary because they can cause driveability problems such as hard starting, rough idling, and poor mileage. These deposits are formed by the oxidation and polymerization of fuel components, particularly olefins, and can form inside carburetor throats, idle air circuits, metering jets, and on throttle and choke plates. Deposits can also form in the air intake systems of fuel injected vehicles, particularly inside throttle bodies and on throttle plates. Removal of oil and dirt from the external surfaces of carburetors and throttle bodies is desirable because contaminants can sometimes cause linkages or other moving parts to stick (ARB, 1999).

Carburetor or fuel-injection air intake cleaners were regulated under "Midterm Measures II" Amendments to the Consumer Products Regulation adopted in October of 1999, and a description of these products is also included in the staff report for that item (ARB, 1999). At that time, the Board adopted a 45 percent VOC limit for these products which was effective on January 1, 2003. On April 27, 2000, ARB adopted the Airborne Toxics Control Measure (ATCM) for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities (AMR). This ATCM prohibited Carburetor or Fuel-Injection Air Intake Cleaners from containing the chlorinated compounds perchloroethylene, methylene chloride, and trichloroethylene in AMR facilities, effective December 31, 2002 (ARB, 2000).

Table VI-7 below summarizes the sales and emissions from carburetor or fuel-injection air intake cleaners based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-7, 110 Carburetor or Fuel-Injection Air Intake Cleaners products were reported in the survey, accounting for over 12,000 pounds per day in sales. The aerosol form dominates the market with over

87 percent of the sales in this category. Carburetor or Fuel-Injection Air Intake Cleaners have estimated VOC emissions of about 2.59 tpd (5,184 pounds per day) in California. The sales weighted average VOC is 47.2 percent, which is above the current limit. This is due to the products which are under the consumer products regulation's "sell-through" provision.

Table VI-7
Carburetor or Fuel-Injection Air Intake Cleaners*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
All Forms	110	12,292	5,184

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

Carburetor or fuel-injection air intake cleaners are used by both "do-it-yourself" and professional mechanics. These products are used during routine maintenance and during repairs. Both aerosol and liquid products are sold, and these forms are used differently. Carburetor or fuel-injection air intake cleaners are required to be registered with the U.S. EPA as fuel additives.

The aerosols are used to quickly remove deposits from carburetors, throttle bodies, and associated parts, usually while in place. Aerosols can be used to remove fuel deposits from the inside surfaces of carburetors by spraying into the carburetor throat while the engine is running. The solvents in the product combine with the fuel and are carried throughout the inside passages of the carburetor, eventually reaching the combustion chamber. These methods feed the product directly into the intake valves, with the engine running, where it will ultimately be combusted (ARB, 1999).

Aerosol products are used similarly in fuel-injection cleaning, which is now the dominant application, as carburetors are no longer used on most motor vehicles. New products are being introduced that are designed exclusively to be introduced directly into vacuum lines. These products are to be used to clean fuel injection systems, with the engine in operation. Consequently, all VOCs should be combusted in the engine. We are proposing clarifying language to the definition to expressly exclude these specific products.

For the liquid products, carburetors and associated parts are generally disassembled and immersed in a container of the liquid product. Some products include a basket that can be used to hold parts that are immersed. Often sensitive parts such as plastics or gaskets must be removed prior to immersion (ARB, 1999).

Carburetor or fuel-injection air intake cleaners are sold primarily in auto parts stores, hardware stores, and by mass merchandisers. Manufacturers or distributors

may also sell these products directly to large customers such as auto repair facilities, car dealerships, and companies that maintain their own vehicle fleets (ARB, 1999).

Product Formulation:

Carburetor or fuel-injection air intake cleaners are typically composed of a variety of solvents including aromatic hydrocarbons, such as xylene, and oxygenated solvents including various alcohols. Exempt compounds such as acetone are also used. The active ingredient is normally an inorganic compound, usually a surfactant, designed to adhere to, and aggregate, soils for removal. To meet the current limit, most products were reformulated using additional acetone. However, there are a few products using water in conjunction with the aforementioned solvents in their formulations.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Carburetor or Fuel-Injection Air Intake Cleaner is 10 percent by weight, effective December 31, 2008. As shown in Table VI-8 using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 4,000 pounds per day or 2.0 tpd.

Table VI-8 also shows that over 3 percent of the market currently complies with the proposed 10 percent VOC limit, none of which are aerosol.

Table VI-8
Carburetor or Fuel-Injection Air Intake Cleaners Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
All Forms	10	2	3.3	4,000

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

The proposed 10 percent VOC limit is designed to allow the industry to formulate effective products using alternative organic solvents, such as methyl esters, which have been shown to be effective when used with acetone. Because of the potential for the engine to stall, these products don't typically contain water. The limit is proposed based on staff's evaluation of technologies and a research project funded by ARB.

In 2003, the Institute for Research and Technical Assistance (IRTA) with assistance from a Technical Review Committee (TRC) undertook a project to develop low VOC and low toxic automotive maintenance products. The TRC consisted of government agencies, environmental organizations, automotive repair shops and facilities, product formulators and manufacturers. Working with the TRC, IRTA was able to demonstrate effective aerosol automotive maintenance products, including carburetor or fuel-injection air intake cleaners. The products were used by technicians at several

automotive maintenance facilities. Under these "real world" scenarios the technicians found the products to perform as well, or nearly as well as, existing solvent-based products.

The IRTA Study was reviewed and approved by the Research Screening Committee. The Board's legislatively mandated Research Screening Committee consists of scientists, engineers, and others knowledgeable, technically qualified, and experienced in air pollution problems. The Committee meets approximately four times a year to review proposed and completed research projects.

The products that performed well had no more than 10 percent VOC by weight. Products that were effective in this category were based on using combinations of methyl esters and acetone. Typical propellants that were effective at delivering the products were hydrocarbons or carbon dioxide. To meet the proposed 10 percent VOC limit, we expect products to use these technologies (IRTA, 2004).

Staff believes these options provide a viable and technically feasible way for the industry to create effective products at the proposed VOC limit without the use of high VOC or toxic compound formulations.

Issue:

1. **Issue:** The proposed VOC limit for Carburetor or Fuel Injection Air Intake Cleaner is technologically forcing. Product needs to remove very difficult residues from various auto parts, leave no residue, be safe for automotive fuel systems, and meet U.S.EPA fuel additive requirements.

Response: As explained in the "Proposed VOC Limit and Compliance" section above, the VOC limit would provide for development of efficacious products by using varying amounts of acetone, or other exempt solvents, with an LVP-VOC, such as methyl esters or hydrocarbons, and maintain efficacy without interfering with U.S.EPA fuel additive requirements.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board. Final Statement of Reasons, Public Hearing to Consider the Airborne Toxics Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities. August 27, 2000. (ARB, 2000)

3. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September, 10, 1999. (ARB, 1999)

4. Institute for Research and Technical Assistance (IRTA). Safer Alternatives to Solvent Aerosol Automotive Products. December, 2004. (IRTA, 2004)

E. Construction, Panel and Floor Covering Adhesive

Product Category Description:

Construction, Panel and Floor Covering Adhesive is currently defined as a non-aerosol one-component adhesive that is designed or labeled for the installation, remodeling, maintenance or repair of: (A) structural and building components that include, but are not limited to, beams, trusses, studs, paneling (drywall or drywall laminates, fiberglass reinforced plastic (FRP), plywood, particle board, insulation board, pre-decorated hardboard or tileboard, etc.), ceiling and acoustical tile, molding, fixtures, countertops or countertop laminates, cove or wall bases, and flooring or subflooring; or (B) floor or wall coverings that include, but are not limited to, wood or simulated wood covering, carpet, carpet pad or cushion, vinyl-backed carpet, flexible flooring material, nonresilient flooring material, mirror tiles and other types of tiles, and artificial grass. Construction, Panel and Floor Covering Adhesive does not include Floor Seam Sealer. Construction, Panel and Floor Covering Adhesive also does not include units of product, less packaging, which weigh more than one pound and consist of more than 16 fluid ounces.

The local air districts in California regulate the use of large size (greater than 16 fluid ounces or one pound) and industrial-use adhesives. Following is a list of local air districts and their corresponding currently applicable adhesive regulations:

- Antelope Valley AQMD, Rule 1168, Adhesive Applications;
- Bay Area AQMD, Rule 8-51, Adhesives and Sealant Products;
- El Dorado County APCD, Rule 236, Adhesives;
- Placer County APCD, Rule 253, Adhesives;
- Sacramento Metropolitan AQMD, Rule 460, Adhesives and Sealants;
- San Diego County APCD, Rule 67.21, Adhesive Materials Application Operations;
- San Joaquin Valley Unified APCD, Rule 4653, Adhesives;
- Santa Barbara County APCD, Rule 353, Adhesives and Sealants;
- Shasta County APCD, Rule 3-32, Adhesives and Sealants;
- South Coast AQMD, Rule 1168, Adhesive and Sealant Applications;
- Tehama County APCD, Rule 4-40, Adhesives and Sealants;
- Ventura County APCD, Rule 74.20, Adhesives and Sealants; and
- Yolo-Solano AQMD, Rule 2-33, Adhesive Operations.

In December 1998, the ARB published a document titled "Determination of Reasonably Available Control Technology (RACT) and Best Available Retrofit Control Technology (BARCT) for Adhesives and Sealants" (RACT/BARCT) (ARB, 1998). The members of the California Air Pollution Control Officers Association's Adhesives Committee (which includes ARB staff) developed the RACT/BARCT for the purpose of

meeting California Clean Air Act requirements and to provide consistency between district rules. The RACT/BARCT contains suggested VOC limits for adhesives and sealants used in commercial and manufacturing processes that are regulated by the districts. The VOC limits in the RACT/BARCT are largely based on limits adopted in existing district adhesive and sealant rules. The district RACT/BARCT limits are established on the basis of grams VOC per liter [g/l], less water and exempt solvents. There are VOC limits for seven adhesive subcategories in the RACT/BARCT that relate to the construction, panel, and floor covering adhesive category for consumer products. Most of the VOC limits for these subcategories range from 130 g/l to 250 g/l; however, there is one specialty substrate VOC limit of 660 g/l.

Volatile organic compound limits and the small size requirements were first introduced for adhesives used in household and institutional settings during the development of the ARB "Phase II" Consumer Products Regulation. Two subcategories, "Aerosols" and "All Others (General Purpose)," were described in the "Phase II" staff report, technical support document, and appendices (ARB, 1991a, 1991b, 1991c). Prior to the "Phase II" Board hearing (January 9, 1992), two additional adhesive subcategories, "Construction and Panel Adhesive" and "Contact Adhesive" were added to the list of "Phase II" categories for regulation. Construction and panel adhesives were combined with carpet and tile adhesives to be regulated as "Construction, Panel and Floor Covering Adhesive" category under the "Midterm Measures II" regulation, adopted in October of 1999, and a description of these products is also included in the Initial Statement of Reasons report for that item (ARB, 1999). ARB staff determined the above to be appropriate because products in both categories were distributed to similar businesses, used in the construction, remodeling, maintenance, and repair of residential and commercial buildings. In addition, products making both claims were reported in the survey conducted by ARB staff for the "Midterm Measures II" rulemaking. At that time, the Board adopted a 15 percent VOC limit for these products, which became effective on December 31, 2002. Floor covering adhesives were not subject to a VOC limit until the effective date of the proposed limit for the combined category.

Table VI-9 below summarizes the sales and emissions from the construction, panel, and floor covering adhesives based on the results of the 2003 Survey. The information in Table VI-9 does not include non-aerosol adhesive products that are sold in large container sizes (more than one pound or 16 fluid ounces), which are regulated by many local air districts in California.

Seventy-six construction, panel, and floor covering adhesive products were reported in the 2003 Survey. The sales of construction, panel and floor covering adhesive products are estimated to be 26,468 pounds per day. After adjusting for market coverage, the 2003 VOC emissions are estimated at 1,924 pounds per day from the sales of small size containers. The sales-weighted average for the small size containers of construction, panel, and floor covering adhesives is estimated to be 9.9 percent VOC.

Table VI-9
Construction, Panel and Floor Covering Adhesive*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Non-aerosol	76	26,468	1,924

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

Construction, panel, and floor covering adhesives are used to construct, remodel, maintain, or repair houses, buildings, bridges, and other types of structures and their appurtenances. The construction industry is one of the largest users of adhesives, requiring about 40 types of adhesives in about 30 different applications (ARB, 1999). These products are used on most types of substrates including wood, wood-derived products (plywood, hardboard, particle board, and insulation board), steel, concrete, masonry, and fiberglass reinforced materials. Another major use for these products is in the installation of decorative finishing materials (e.g., floor and wall carpeting and tiles, paneling, cove bases, ceiling tiles, etc.) to the inside of buildings.

Appropriate product selection must be made for each application on the basis of performance requirements (such as durability and strength), type of substrates, working properties needed, desired production rates, and cost. Environmental conditions such as prolonged soaking, wetting and drying cycles, extremely low or high temperatures, and other adverse conditions that may arise during construction and service life must be considered when selecting the appropriate adhesive to use.

Construction, panel, and floor covering adhesives are sold in sizes ranging from 4 fluid ounce tubes to 55 gallon drums. The more common sizes used in construction projects are 10 to 11 fluid ounce and 29 fluid ounce disposable cartridges that fit in half-barrel caulking guns. As mentioned before, products greater than 16 fluid ounces or one pound and industrial-use adhesives are regulated by California local air pollution control districts.

Construction, panel, and floor covering adhesives are primarily sold through hardware stores, home supply centers, warehouse clubs, and discount chain stores. Distributors also sell these products directly to firms with a large customer base, such as contractors, residential and commercial builders, janitorial companies and corporations, and organizations that maintain their own facilities.

Individuals or "do-it-yourselfers", and professionals employed in residential and commercial development sites use construction, panel, and floor covering adhesives. Although these products are used in the "manufacture" or "construction" of homes and facilities at residential and commercial development sites, the adhesive products do not qualify as "industrial" use products as defined in the consumer products regulation

because the development sites are temporary. In other words, the adhesive products are not being used at a permanent site or establishment to produce goods or commodities. In addition, many of these adhesive products are available for purchase at hardware stores, home supply centers, and warehouse clubs by both professional contractors and household users.

Product Formulation:

Typical construction, panel, and floor covering adhesives may contain any combination of the following components: diluent, binder, catalyst, hardener, accelerator, inhibitor, retarder, filler, plasticizer, stabilizer, and wetting agent (ARB, 1999).

The diluent (water-based or solvent-based) is the solvent vehicle for other adhesive components which also provides viscosity control to make a uniformly thin adhesive coating possible. The binder (resin system) may be the most important component because it provides the adhesive and cohesive strength in the bond. Fillers are non-adhesive materials that improve the working properties, permanence, strength, or other qualities of the adhesive bond. Catalysts and hardeners are curing agents for adhesive systems, and accelerators, inhibitors, and retarders control the curing rate. Plasticizers provide the adhesive bond with flexibility or distensibility. Stabilizers help the adhesive increase its resistance to adverse service conditions such as light, heat, radiation, etc. Wetting agents promote interfacial contact between the adhesive and adherends (substrates) by improving the wetting and spreading qualities of the adhesive. Depending on the particular type of formulation, additional components such as tackifiers, humectants, thickeners, and foam control agents may be used (ARB, 1999).

The water-based formulations that are included in the 2003 Survey contain water in the range of 10 to 50 percent by weight. Although water is the primary diluent, some VOC co-solvents are used in the range of 0.1 to 12 percent and may include stoddard solvent, mineral spirits, toluene, light solvent aliphatic naphtha or ethyl alcohol. Some formulations also use LVP-VOCs such as ethylene glycol and propylene glycol ranging from 0.1 to 4 percent. Resins used in these formulations may include acrylic resin, acrylic copolymer, styrene butadiene polymer or acrylonitrile copolymer in amounts that range from 1 to 40 percent. The most common fillers used are limestone (calcium carbonate), kaolin and silica (quartz, crystalline and amorphous) in the range of 1 to 80 percent.

The typical solvent-based formulations can contain the following VOC diluents: toluene, xylene, hexane, hydrotreated light petroleum distillate, dimethylpentane, dimethylbutane, cyclohexane, isohexane, or light aliphatic solvent naphtha in the range of 0.1 to 15 percent. Exempt compounds, such as acetone and methyl acetate, may also be used as a diluent in the range of 3 to 25 percent. The resins found in these formulations may include polymethylene polyphenyl isocyanate, methylene bisphenyl diisocyanate, styrene-butadiene polymer, and aromatic hydrocarbon resin in the range

of 1 to 60 percent. The fillers may include silica (quartz, crystalline, and amorphous), talc, kaolin, and limestone (calcium carbonate) in amounts that range from 1 to 90 percent. A few formulations may also contain titanium dioxide as a colorant in up to 15 percent by weight.

All of the floor covering adhesives, most of the general purpose construction adhesives, and some of the subfloor adhesives reported in the 2003 Survey are water-based. Some of the general purpose adhesives and subfloor adhesives are solvent-based.

Proposed VOC Limit and Compliance:

The proposed VOC limit for construction, panel and floor covering adhesives is 7 percent by weight, effective December 31, 2008. As shown in Table VI-10, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 818 pounds per day or 0.4 tons per day for the Construction, Panel and Floor Covering Adhesive category.

Table VI-10
Construction, Panel and Floor Covering Adhesive Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Non-aerosol	7	42	52.7	818

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Complying products include water-based and solvent-based technologies. The proposed limit is expected to mainly affect solvent-based products. Reformulation options include switching from solvent-based formulations to water-based formulations, using alternative LVP-VOC solvents or a combination of VOC and LVP-VOC solvents, and using exempt VOCs such as acetone and methyl acetate. These alternative ingredients are already being used in some of the general purpose construction adhesives.

Issue:

1. **Issue:** The industry proposed a separation of construction, panel and floor covering adhesive category into three subcategories with different VOC limits: general purpose construction adhesive with a 7 percent VOC limit, floor covering adhesive with a 1.5 percent VOC limit, and subfloor adhesive with 10 percent VOC limit (NPCA/ASC, 2006).

Response: After careful analysis of the data, staff didn't believe it was necessary to divide the category into three subcategories. Products complying with

staff proposed 7 percent VOC limit were reported for each of these subcategories, indicating that it is technologically feasible to formulate complying multipurpose construction adhesives, floor covering adhesives and subfloor adhesive products. While the 2003 Survey data indicated that most of the floor covering adhesives currently would meet the industry proposed 1.5 percent VOC limit, ARB staff has proposed a single limit. We believe that a single limit would be less complicated to implement and allow for products that make claims falling in more than one subcategory. Industry representatives are generally supportive of ARB proposal (NPCA, 2006).

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September, 10, 1999. (ARB, 1999)

3. Air Resources Board. Staff Report. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991a)

4. Air Resources Board. Technical Support Document. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991b)

5. Air Resources Board. Appendices. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991c)

6. Air Resources Board. Final Statement of Reasons for Rulemaking, Public Hearing to Consider the Adoption of Amendments to the Regulation for Reducing Volatile Organic Compound Emissions from Consumer Products -- Phase II. January 9, 1992. (ARB, 1992, FSOR)

7. Air Resources Board. Determination of Reasonably Available Control Technology and Best Available Retrofit Control Technology for Adhesives and Sealants. December 1998. (ARB, 1998)

8. NPCA. Comments on ARB Proposed Amendments to the Consumer Products Regulation (CONS-2). September 25, 2006. (NPCA, 2006)

9. NPCA/ASC. NPCA/ASC Proposal for Technologically and Commercially Feasible VOC Standards for Construction Adhesives. July 21, 2006. (NPCA/ASC, 2006)

F. Disinfectant

Product Category Description:

Disinfectant is defined as any product intended to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects, and whose label is registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). "Disinfectant" does not include any of the following: (A) products labeled solely for use on human or animals, (B) products labeled solely for agricultural use, (C) products labeled solely for use in swimming pools, therapeutic tubs, or hot tubs, (D) products, which are (1) sold exclusively to medical or veterinary establishments, and (2) are labeled to be used on heat sensitive critical, or semi-critical medical devices, or medical equipment surfaces prior to high level disinfection, and (E) products, which are subject to a VOC limit under another regulated category in section 94509(a), as dictated by the primary use indicated on the principal display panel.

Disinfectants were first defined under "Phase II" of the consumer products regulation adopted in January of 1992, and a description of these products was included in the staff report for that item (ARB, 1991a). However, the Board did not adopt the proposed VOC limit for this category, since the California Department of Health Services (DHS) recommended that additional study be performed before specific VOC limits for aerosol disinfectants were adopted.

Disinfectants are anti-microbial pesticides. As such, they must be registered with the U.S. Environmental Protection Agency (U.S. EPA) according to FIFRA requirements and by the California Department of Pesticide Regulation. The U.S. EPA requires manufacturers to test formulations by using accepted methods for microbicidal activity, stability, and toxicity to animals and humans (CDC, 2003). FIFRA requires users of products to follow the labeling directions. The following statement appears on all EPA-registered product labels under the Directions for Use heading: *"It is a violation of federal law to use this product in a manner inconsistent with its labeling."* To be effective, products must be used in accordance with label directions, such as dilution, contact time and method of application.

The U.S. EPA divides disinfectant products into two major types: hospital use disinfectants and general use disinfectants. Hospital use disinfectants are used in medical and dental settings on walls, floors, instruments and other surfaces. General use disinfectants are the majority of products used in households.

Under FIFRA requirements, a general disinfectant has limited efficacy claims if it effectively inactivates a specific microorganism group only, such as gram positive (*Staphylococcus aureus*) or gram negative bacteria (*Salmonella choleraesuis*). If a disinfectant inactivates both gram positive and gram negative bacteria groups then it is considered a broad spectrum disinfectant. A hospital disinfectant is a broad spectrum disinfectant that must also be effective against *Pseudomonas aeruginosa*. Many

disinfectants also list fungicidal and virucidal claims, which must be substantiated with performance requirements for each specific organism (U.S. EPA).

The Health and Safety Code 41712 (e)(1) directs the ARB to consider recommendations from a health agency (local, state or federal) regarding regulation of health benefit products. This process was put in place to ensure that public health would not be compromised by regulating the VOC content of such products. Because disinfectants are considered health benefit products staff consulted with DHS to discuss the proposed VOC limits and receive their expert advice as to whether adopting the proposed limits would affect product efficacy.

Table VI-11 below summarizes the sales and emissions from disinfectants based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-11, disinfectants are sold in both the aerosol and non-aerosol forms, with non-aerosol products dominating the market in terms of sales. However, the aerosol products contribute approximately 80 percent of the VOC emissions from this category. Disinfectants are one of the larger emissions sources in the consumer products inventory, with estimated VOC emissions of about 8.5 tpd (16,966 pounds per day) in California. The sales weighted average VOC content for aerosol products is 76.3 percent by weight and 0.5 percent by weight for non-aerosol products, considering dilutions.

Table VI-11
Disinfectants*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Aerosol	63	17,834	13,610
Non-aerosol	337	207,016	3,356
Total	400	224,850	16,966

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

The disinfectant category consists of aerosols, liquids, powders and granules, pumps, foams and wipes (ARB 2003). Disinfectants are used in household, industrial and institutional (I&I) and health care settings. Aerosol disinfectants have a significant share of the household market, while liquids dominate in the Institutional and Industrial (I&I) and health care markets. Liquid disinfectants provide sufficient disinfection for the I&I market and are more cost effective than aerosols (ARB 1991a).

Product Formulation:

The VOC ingredients in aerosol disinfectants are ethanol, isopropanol, and hydrocarbon propellants (propane, n-butane, and isobutane). The alcohols, along with quaternary ammonium compounds (quats) and phenolics (e.g. 2-phenyl phenol) comprise the active ingredients in aerosol formulations (ARB, 2003). Other VOC or low vapor pressure (LVP-VOC) ingredients may include small amounts of fragrances, glycols, and corrosion inhibitors. According to the 2003 ARB survey data the total VOC content of aerosol disinfectants ranges from 8 to 90 percent by weight with a wide range of efficacy claims. Typically, the higher VOC products provide for a wider range of claims, which include virucidal and tuberculocidal disinfection.

The VOC ingredients in non-aerosol disinfectants are isopropanol, ethanol, pine oil and 2-butoxyethanol. The alcohols, along with phenolics and quats comprise the active ingredients in non-aerosol formulations (ARB, 2003). According to the 2003 ARB survey data, the total VOC content of non-aerosol disinfectants ranges from 0 to 69 percent by weight. Over 97 percent of non-aerosol disinfectants are sold as 0-5 percent VOC by weight and most are diluted with water prior to use.

Proposed VOC Limit and Compliance:

The proposed VOC limits for disinfectants are 70 percent by weight for aerosol products, and 1 percent by weight for non-aerosol products, effective December 31, 2008. To allow the time necessary for FIFRA registration requirements, the effective date of the VOC limits for disinfectants is one year after December 31, 2008, as specified in section 94509(d) of the Consumer Products Regulation. This means the effective date would be December 31, 2009. The sell-through period also starts one year after the proposed date, as specified in section 94509(d).

In consulting with medical experts in the field of public health and manufacturers of disinfectants, we have determined that the proposed VOC limits will still allow disinfectant products to achieve an appropriate level of disinfection and maintain all existing efficacy claims. Staff is continuing to work with DHS staff to ensure that the proposed limits do not adversely impact the efficacy of Disinfectants.

As shown in Table VI-12 the proposed limits for disinfectants will result in an estimated reduction of 2,290 pounds per day, or approximately 1.1 tpd. The complying market share for aerosol disinfectants is over 6 percent with 24 products that currently meet the proposed limit. For the non-aerosol products, the complying market share is over 92 percent with 264 products that currently meet the proposed limit.

Table VI-12
Disinfectant Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Aerosol	70	24	6.4	1,314
Non-aerosol	1	264	92.6	976
Total				2,290

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Reformulation options that could be used by manufacturers to meet the proposed VOC limit include:

(a) Reduction of alcohol level for both aerosol and non-aerosol forms.

(b) Changing the level of phenolics and non-alcohol active ingredients, such as quaternary ammonium compounds, to help offset a reduction in alcohol.

(c) Reduction of VOC propellant level, and/or substitution of part or all of VOC propellant with non-VOC propellant (e.g. carbon dioxide).

Issues:

1. **Issue:** These products must remain effective for all types of surfaces because they are health benefit products.

Response: ARB staff agrees. In accordance with state law, ARB staff has consulted with the California Department of Health Services and the disinfectant manufacturing industry to ensure that the proposed VOC limits are achievable while maintaining the same level of efficacy.

2. **Issue:** CSPA member companies manufacturing these important health-benefit products believe that the 70 percent and 1 percent limits proposed may be technologically and commercially feasible. We therefore are willing to support adoption of 70 percent for aerosol form and 1 percent for non-aerosol form VOC limits for this category.

Response: Comment noted. Staff agrees that the proposed limits are commercially and technologically feasible.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board. Staff Report. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991a)

3. Air Resources Board. Technical Support Document. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991b)

4. Air Resources Board. Appendices. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991c)

5. Air Resources Board. Final Statement of Reasons for Rulemaking, Public Hearing to Consider the Adoption of Amendments to the Regulation for Reducing Volatile Organic Compound Emissions from Consumer Products -- Phase II. January 9, 1992. (ARB, 1992, FSOR)

6. Center for Disease Control and Prevention. Morbidity and Mortality Weekly Report, Appendix A. Regulatory Framework for Disinfectants and Sterilants. December 19, 2003. (CDC, 2003)

7. U.S. Environmental Protection Agency. Disinfectants for use on hard surfaces: Efficacy Data Requirements. DIS/TSS-1 http://www.epa.gov/oppad001/dis_tss_docs/dis-01.htm, January 22, 1982. (U.S. EPA)

G. Engine Degreasers (aerosol)

Product Category Description:

Engine degreasers are designed to remove grease, grime, oil, and other contaminants from the external surfaces of automotive engines and other mechanical parts. These products can also be used to clean engines on motorcycles, boats, lawnmowers, and other powered vehicles.

Aerosol engine degreasers were regulated under "Midterm Measures II" of the consumer products regulation adopted in October of 1999, and a description of these products is also included in the staff report for that rulemaking (ARB, 1999). At that time, the Board adopted a 35 percent VOC limit for these products which was effective on December 31, 2004. On April 27, 2000, ARB approved the Airborne Toxics Control Measure (ATCM) for Emissions of Chlorinated Toxic Air Contaminants from Automotive

Maintenance and Repair Activities (AMR). This ATCM prohibited Engine Degreasers from using the chlorinated compounds perchloroethylene, methylene chloride, and trichloroethylene in AMR facilities, effective December 31, 2002.

Table VI-13 below summarizes the sales and emissions from aerosol engine degreasers based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-13, there are 47 aerosol Engine Degreasers on the market and they account for an estimated VOC emissions of about 1.05 tons per day (2,104 pounds per day) in California. The sales-weighted average VOC is 23.5 percent.

Table VI-13
Engine Degreasers (aerosol)*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Aerosol	47	9,116	2,104

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

Engine degreasers are used by both "do-it-yourself" and professional mechanics. These products are normally sprayed onto the engine while it is running or while the engine is still warm. After application, the user is then instructed to allow time for the product to penetrate soils. For tough-to-remove deposits, the user may need to scrub the engine with a brush. The user is then directed to rinse the engine and to dispose of the rinsate in accordance with applicable environmental regulations.

Engine degreasers are used by household, commercial, and institutional consumers. Commercial and institutional users include fleet managers, car washes, automotive detail shops, and car dealerships. Engine degreasers are typically used by themselves, but can be combined with steam or high pressure wash cleaning to maximize the cleaning effectiveness (ARB, 1999).

Product Formulation:

Aerosol engine degreasers vary in formulation, but most share several common features. These degreasers use ingredients such as 2-butoxyethanol, d-limonene, alcohols, LVPs, inorganics, and water. Most use either a hydrocarbon propellant or carbon dioxide to propel the can contents onto the engine surface. The combination of propellant and spray stream is chosen to provide a forceful stream, rather than a misty spray, to enhance the product's cleaning ability. Because it is more desirable to have a forceful stream, aerosol engine degreasers do not need as much propellant as other product categories (ARB, 1999). A forceful stream can be achieved by using a small

amount of a propellant such as propane or isobutane. Higher amounts of propellant are used when a mist is needed due to the blending of different propellants.

Foaming is also a desired characteristic in this category because extended contact time, included with the forceful spray, allows for a more thorough cleaning action. Products that foam are very effective when allowed to soak in and penetrate the soils for a small amount of time before rinsing off.

Proposed VOC Limit and Compliance:

The proposed VOC limit for Engine Degreasers (aerosol), is 10 percent by weight, effective December 31, 2008. As shown in Table VI-14, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 1,240 pounds per day or 0.62 tons per day.

Table VI-14 also shows that 9.1 percent of the market currently complies with the proposed 10 percent VOC limit.

Table VI-14
Engine Degreasers (aerosol) Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Aerosol	10	4	9.1	1,240

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

The 10 percent by weight VOC limit is proposed based on results of a research project funded by ARB. The goal of the research was to develop low VOC and non-toxic aerosol maintenance products.

In 2003, the Institute for Research and Technical Assistance (IRTA) with assistance from a Technical Review Committee (TRC) undertook the project. The TRC consisted of government agencies, environmental organizations, automotive repair shops and facilities, product formulators and manufacturers. Working with the TRC, IRTA was able to demonstrate effective aerosol automotive maintenance products, including general purpose degreasers. The products were used by technicians at several auto maintenance facilities. Under these "real world" scenarios the technicians found the products to perform as well, or nearly as well as existing products.

The products that performed well had no more than 10 percent VOC by weight. Products that were effective were based on the following technologies: LVP-VOC, alkaline, surfactant, or exempt VOC solvents. Typical propellants that were effective at delivering the products were hydrocarbons or carbon dioxide. To meet the proposed 10 percent VOC limit, we expect products to use these technologies.

Other reformulation options that could be used by manufacturers to meet the proposed limit include the use of more acetone, water, LVP, and inorganics as well as exempt propellants. Staff believes these options provide a viable and technically feasible way for the industry to create effective products at the proposed VOC limit without the use of high VOC or toxic compound formulations. This has been shown by current products on the market, in California, with similar technology that do meet the proposed limit (Kyzen, 2006).

Issues:

1. **Issue:** The proposed VOC limit for Engine Degreaser is not technologically, or commercially, feasible.

Response: Survey data show that 9 percent of the products in this category are currently able to meet the limit. Also, as explained in the "Proposed VOC limit and Compliance" section, research sponsored by ARB demonstrated that non-toxic, low VOC alternative aerosol engine degreaser can be formulated at the proposed limit and be just as effective as those with higher VOC content.

2. **Issue:** ARB staff should not use the IRTA study as proof of low VOC capability because the study is flawed in concept and execution.

Response: ARB staff disagrees with the comment and feels the study conducted by IRTA was performed in a manner useful to this regulation. ARB believes that the field study conducted by IRTA, at automotive repair facilities, is more relevant than a laboratory study would be. ARB staff has been made aware of specific products on the market, or about to be introduced to the market, that can comply with the proposed 10 percent VOC standard.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board. Final Statement of Reasons, Public Hearing to Consider the Airborne Toxics Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities. August 27, 2000. (ARB, 2000)

3. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September, 10, 1999. (ARB, 1999)

4. Institute for Research and Technical Assistance (IRTA). Safer Alternatives to Solvent Aerosol Automotive Products. December, 2004. (IRTA, 2004)

5. Kyzen Corporation. Product Bulletin: Kyzen Cyber Solv. September, 2006. (Kyzen, 2006)

H. Floor Polish or Wax

Product Category Description:

Floor Polish or Wax products are designed to polish, protect, or enhance floor surfaces by leaving a protective coating. They are designed to be periodically replenished or replaced. This category does not include spray buff products, products that are only used to clean the floor, floor finish strippers, products for unfinished wood floors, nor coatings subject to architectural coatings regulations. The category does include "clean and polish" products.

Floor Polish or Wax products were regulated under Phase I of the Consumer Products Regulation adopted in October of 1990, and a description of these products is also included in the staff report for that item (ARB, 1990a). At that time, the Board adopted VOC limits for these products that became effective on January 1, 1994. The VOC limits adopted for Floor Polish or Wax are: 7 percent for products used on flexible flooring material, 10 percent for products used on non-resilient flooring material, and 90 percent for products used on wood floors. Further consideration of products for wood floors has been deferred to the 2007 rulemaking and therefore, will not be discussed in this section.

Table VI-15 below summarizes the sales and emissions from Floor Polish or Wax for resilient (flexible) and non-resilient floors, based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). Floor Polish or Wax products have estimated VOC emissions of about 0.73 tpd (1,452 pounds per day) in California.

Table VI-15
Floor Polish or Wax*

Products for:	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Resilient floors	340	128,694	1,320
Non-resilient floors	113	9,884	132
Total	453	138,578	1,452

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

Floor Polish or Wax is used by both general consumers, as well as commercial and institutional customers. Commercial and institutional products account for a vast majority of reported products and total sales.

Household products for resilient (or flexible) and non-resilient floors are generally applied in a single layer to a clean floor with a mop and allowed to dry. Commercial products for flexible and non-resilient floors are generally applied to a dry, clean floor surface that has been stripped of all prior coats of polish. The user (generally maintenance staff) applies the floor finish with a mop in a thin, even layer, avoiding using excess finish or allowing the product to puddle. The user allows the coating to dry (usually about 30 minutes), then applies another layer. The user repeats this process until the desired number of coats has been applied, usually 3-5 coats total. Depending on the manufacturer recommendations, the final step may then be to buff the finish to a shine ("pop the gloss") using a buffer or burnishing machine. The floor must remain free of foot traffic during the stripping and refinishing process. Therefore, it's important for the process to be completed as quickly as possible, to minimize possible impact to business resulting from down-time (Rohm and Haas, 2006).

Floor Polish or Wax products are sold to household consumers, commercial, and industrial establishments. They can be found at janitorial stores, supermarkets, warehouse and hardware stores, and the Internet, as well as through manufacturers' and distributors' sales representatives.

Product Formulation:

Floor Polish or Wax products for flexible and non-resilient floors are primarily composed of water and polymer solids. Other ingredients include coalescent aids and other modifiers (such as levelers, plasticizers, viscosity modifiers, etc.) that optimize product properties. The coalescent aids are typically volatile glycol ethers that help the polymer solids form a smooth continuous coating over the floor surface. Some floor finishes that use cross-linking polymers often contain inorganic compounds (metallic salts) that foster the linkages.

Proposed VOC Limit and Compliance:

The proposed VOC limits for Floor Polish or Wax products for resilient and non-resilient floors are listed in Table VI-16, and would become effective December 31, 2010. As shown in Table VI-16, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 948 pounds per day or 0.47 tpd.

Table VI-16 also shows the current complying market share for the proposed limits. A majority of the markets for resilient and non-resilient floors already comply with the proposed VOC limit of one percent.

Table VI-16
Floor Polish or Wax Proposal*

Products For:	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Resilient floors	1	150	66.8	854
Non-resilient floors	1	58	62.5	94
Total				948

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Reformulation options for products for resilient and non-resilient floors include increasing water and solids content, and/or using LVP-VOC coalescent aids. Manufacturers may also develop polymer technology that require less VOC coalescent. A minimal number of product reformulations are anticipated, as the sales weighted average VOC content is 1.025 for products used on resilient floors, and 1.340 for products for non-resilient floors.

Issue:

1. **Issue:** Several industry representatives have expressed concern over the proposed limit of one percent. They contend that the standard will thwart development of new, harder polymer systems that are easier to maintain and require less frequent stripping and recoating, resulting in increased labor costs and increased overall emissions.

Response: The complying market shares for the proposed limits are both nearly two thirds. The complying products are also some of the highest-sales products reported in the 2003 Survey. Such a high complying market share that includes the most popular products seems to overwhelmingly support the proposed limits of one percent. However, in order to ensure that all of industry has sufficient time to complete the transition, staff is proposing an effective date of December 31, 2010. Staff also reminds manufacturers that alternative means of compliance such as an Innovative Product Exemption may be suitable, if they can demonstrate that use of their higher VOC products truly result in lower VOC emissions compared to a compliant product. Use of an Alternative Control Plan may be appropriate for manufacturers who wish to offset excess emissions from their non-compliant floor polishes with their other regulated products that over-comply with applicable VOC limits.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board, Staff Report. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products: Phase I. August, 1990. (ARB, 1990a)

3. Rohm and Haas, Presentation to ARB staff. June 2006. slide 8. (Rohm and Haas, 2006)

I. Furniture Maintenance Product (non-aerosol)

Product Category Description:

Furniture maintenance products are labeled for the purpose of polishing, protecting or enhancing finished wood surfaces other than floors such as paneling, cabinets, and furniture and other furniture surfaces including but not limited to acrylics, ceramics, plastics, stone surfaces, metal surfaces, and fiberglass. These products beautify and enhance natural woodgrain, leaving a clear and shiny surface. These products may be waxes, polishes, or conditioners.

Furniture maintenance products do not include dusting aids or wood cleaners, which are regulated as separate categories (ARB, 2004). Furniture maintenance products also do not include products designed solely for the purpose of cleaning, or products that leave a permanent finish such as stains, sanding sealers, and lacquers.

Furniture maintenance products were originally regulated under Phase I of the Consumer Products Regulation adopted in October of 1990, and a description of these products is also included in the staff report for that item (ARB, 1990a). At that time, the Board adopted a 25 percent VOC limit for aerosol forms and 7 percent VOC limit for all other forms except solid/paste forms (effective on January 1, 1994). Effective December 31, 2004, only the aerosol form limit was lowered to 17 percent VOC under "Midterm Measures II" of the Consumer Products Regulation adopted in October of 1999, and the description is included in the staff report for that item (ARB, 1999).

Table VI-17 below summarizes the sales and emissions based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). The non-aerosol form has estimated California VOC emissions of 0.17 tpd (348 pounds per day).

The non-aerosol form includes liquids and liquid-impregnated wipes, pump sprays, semisolids, and solids. The majority of products reported were liquids.

Table VI-17
Furniture Maintenance Product *

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Non-Aerosol	76	7,046	348

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

Furniture maintenance products are used for polishing, protecting or enhancing finished wood surfaces other than floors and other furniture surfaces including but not limited to acrylics, ceramics, plastics, stone surfaces, metal surfaces, and fiberglass. Furniture maintenance products are usually sold to the consumer market through supermarkets, grocery stores, and warehouse stores. Products sold to businesses are supplied through a variety of ways including direct sales, catalogs, and janitorial stores or services.

Product Formulation:

Furniture maintenance products are emulsions that are applied to a cloth or pad, and are then rubbed into the wood or other furniture surface. During wiping, the water phase is absorbed by the cloth while the solvent/wax/polish phase remains on the wood or other furniture surface. The solvents eventually evaporate, leaving the wax/polish layer.

Some products are designed to perform more than one function, such as "clean" and "protect" furniture. To clean, these products generally rely on solvents to dissolve old wax or polish layers. Dissolving previous wax helps to minimize waxy buildup. Some products also contain silicones, which protects furniture surfaces against water damage. Fragrance is also an ingredient found in many furniture maintenance products, which may add slightly to the overall VOC content of the product. Citrus oils such as lemon or orange are commonly found in these products.

Proposed VOC Limit and Compliance:

The proposed VOC limit for furniture maintenance products is 3 percent by weight, effective December 31, 2008. As shown in Table VI-18, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 122 pounds per day or 0.06 tpd.

Table VI-18 also shows that nearly 30 percent of the market currently complies with the proposed 3 percent VOC limit.

Table VI-18
Furniture Maintenance Product Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Non-Aerosol	3	46	46.2	122

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

There are reformulation options available that make reductions in VOC content technically and commercially feasible. We expect manufacturers of noncompliant product to formulate products similar to the compliant products, which comprise nearly 30 percent of the market. Reformulation options that can be used to meet the proposed limit include the use of water, LVP-VOC hydrocarbon solvents, glycol ethers, as well as dibasic esters. Many products in this category are water-based, and there are viable non-VOC alternatives available for substitution.

Issue:

1. **Issue:** Industry recommends a VOC limit of 4 percent.

Response: As shown above in Table VI-20, over 45 percent of the market, as reported in the 2003 Consumer & Commercial Products Survey, already complies with the proposed 3 percent VOC limit. This high complying market share indicates commercial feasibility and customer acceptance for products formulated at or below the proposed 3 percent VOC limit.

REFERENCES

1. Air Resources Board. Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for Para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products. May 7, 2004 (ARB, 2004)

2. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

3. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September, 10, 1999. (ARB, 1999)

4. Air Resources Board, Staff Report. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products: Phase I. August, 1990. (ARB, 1990a)

J. General Purpose Cleaners (aerosol)

Product Category Description:

General Purpose Cleaners are products designed and labeled for use on a variety of hard surfaces to remove a multitude of soils. Products in this category are used to clean a variety of surfaces and many types of soils or contaminants from household, commercial and/or institutional surfaces. Because of this, product use claims for these products often overlap with the use claims for similar regulated categories. The regulation addresses this by not applying the "most restrictive limit" provision to products that meet the definition for General Purpose Cleaners.

The Board first regulated General Purpose Cleaners under the "Phase I" Consumer Products Regulation in 1990. At that time, the Board approved a 10 percent by weight VOC limit for all product forms. In 1999, the Board further regulated the non-aerosol product form by adopting a 4 percent by weight VOC limit (ARB, 1999). Although past regulatory actions resulted in significant emission reductions, we believe that technology now exists to further reduce VOC emissions from the aerosol product form. Therefore, we are proposing to amend the regulation to reduce the VOC content limit for aerosol General Purpose Cleaners to 8 percent by weight VOC.

In addition, we are proposing to modify the definition for "General Purpose Cleaner" to include products that are designed to clean stovetops, cook tops, and/or microwave ovens. These products are currently sold and labeled as "stovetop range cleaner," "cook top cleaner," "stovetop cook top cleaner,' or "microwave oven cleaner" and have not been subject to the Consumer Products Regulation. However, these products have functions similar to General Purpose Cleaners in that they are designed to clean hard surfaces and often have a surface conditioning function. Therefore, we believe it is appropriate to include stovetop, cook top, and microwave oven cleaners in the general purpose cleaner category.

Table VI-19 below summarizes the sales and emissions from aerosol General Purpose Cleaners based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003).

Table VI-19
General Purpose Cleaners - Aerosol*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Aerosol	142	6,836	788

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

As shown in the table above, 142 aerosol products were reported with sales of 6,836 pounds per year. Aerosol General Purpose Cleaners have a sales-weighted average VOC (SWA-VOC) content of about 11 percent by weight.

Product Use and Marketing:

General Purpose Cleaners are used by household, commercial, and institutional consumers for general all-purpose cleaning of many soiled surfaces. These products are designed to clean a variety of hard surfaces such as floors, walls, countertops, and kitchen surfaces, including hard surface kitchen appliances. General Purpose Cleaners make claims to remove soils such as grease, oil, dirt, food spills, tobacco smoke, soap scum, and dust. In addition to cleaning, some products may also have a surface conditioning function (e.g. abrasive cleaners), while others make disinfecting claims (ARB, 2003). Products are either applied directly to the surface or indirectly with a cloth or sponge; some scrubbing is usually required but rinsing may or may not be necessary.

General Purpose Cleaners are available from a variety of retail outlets and are sold to household consumers, janitors, restaurants, and other commercial or institutional establishments for general cleaning and, to a certain extent for disinfecting. General purpose cleaner products can be marketed in a variety of ways. Predominantly, these products are marketed as "general purpose cleaner," "general purpose cleaner/degreaser," "all-purpose cleaner," "multi-surface cleaner," "glass and surface cleaner," or "disinfectant cleaner." Another example of how these products are marketed is by using the name of the specific active ingredient in the product's formulation such as "citrus," "pine," "bleach," or "ammoniated" cleaner.

General Purpose Cleaners that make germ-killing claims are registered with the United States Environmental Protection Agency (U.S. EPA) under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). They must also register with the California Department of Pesticide Regulation (DPR) prior to being marketed in the State of California. For the purpose of this regulation, products primarily labeled as "General Purpose Cleaner" that make anti-bacterial or disinfecting claims are not considered disinfectants.

Product Formulation:

General Purpose Cleaners are formulated with solvents such as, glycol ethers, terpenes, and alcohols to provide efficient active solvency power for most oils, greases, and dirts. This solvency aids in the dissolution mechanism of soil removal. Aerosol products contain between 3 to 8 percent propellant, which is commonly a blend of hydrocarbons (propane / isobutane / n-butane). Products in this category may also contain a mild abrasive, inorganic salt, or an antimicrobial compound. Water usually makes up the remainder of the product ingredients.

For some products, antimicrobial properties are achieved as a "side effect" of other cleaning ingredients such as cationic and anionic surfactants, hypochlorite, or sodium percarbonate (oxygenated bleach) in the formulation. Addition of antimicrobial ingredients such as a quaternary ammonium compound (e.g. alkyl dimethyl benzyl ammonium chloride) is also common (ARB, 2003).

Proposed VOC Limit and Compliance:

We are proposing to reduce the VOC content limit for the aerosol product form of General Purpose Cleaners from 10 percent to 8 percent VOC by weight, effective December 31, 2008. In order to provide time for registration under FIFRA, an additional year is allowed for products that make "disinfecting" or "sanitizing" claims. As shown in Table VI-20, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 94 pounds per day or 0.05 tons per day.

Table VI-20 also shows that about 12 percent of the market currently complies with the proposed 8 percent VOC limit.

Table VI-20
General Purpose Cleaners Proposal (aerosol)*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Aerosol	8	40	11.5	94

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

As mentioned previously, the VOC ingredients in General Purpose Cleaners are mainly glycol ethers, terpenes, and alcohols. As fast drying is generally not critical to the product performance, a variety of glycol ethers, which qualify as low vapor pressure (LVP)-VOCs are available for reducing the VOC content of cleaners. For example, a LVP-VOC propylene-oxide based glycol ether (i.e. P-series glycol ethers) such as 1-butoxy-2-propanol has a similar evaporation rate to 2-butoxyethanol (ethylene-oxide based glycol ether; E-series glycol ethers), and has a higher efficiency in reducing the surface tension of water which allows for better cleaning. We also expect manufacturers to reformulate with other LVP-VOC solvents such as alkyl methyl esters (soy methyl esters), or hydrocarbons.

Issues:

1. **Issue:** The proposed VOC limit may not be commercially feasible. To meet the efficacy requirements needed in order for these products to perform on the variety of surfaces and multitude of soils, industry suggests that the VOC limit be set at no lower than 8 percent VOC by weight.

Response: We agree and have revised the proposed VOC limit accordingly.

2. **Issue:** The definition should include: ...a product "labeled for use" on a variety of hard surfaces.

Response: We agree and have revised the definition accordingly.

REFERENCES

1. Air Resources Board. Staff Report, Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products. August, 1990. (ARB, 1990)

2. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September 10, 1999. (ARB, 1999)

3. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

K. General Purpose Degreasers

Product Category Description:

General Purpose Degreasers are defined in the regulation as any product labeled to remove or dissolve grease, grime, oil and other oil-based contaminants from a variety of substrates, including automotive or miscellaneous metallic parts. General Purpose Degreasers do not include products used exclusively in "solvent cleaning tanks or related equipment," or products that are (A) sold exclusively to establishments which manufacture or construct goods or commodities; and (B) labeled "not for retail sale."

To date, the Board has taken several actions pertaining to the regulation of General Purpose Degreasers. Under the Mid-term I Measures Amendments to the Consumer Products Regulation, and Mid-term II Measures Amendments to the Consumer Products Regulation, the Board established volatile organic compound (VOC) limits for both aerosol and non-aerosol product forms.
On April 27, 2000, ARB passed the Airborne Toxics Control Measure (ATCM) for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities (AMR). This ATCM prohibited the manufacture, use, or sale of automotive maintenance products containing methylene chloride (MeCl), perchloroethylene (Perc), and/or trichloroethylene (TCE). This action included General Purpose Degreasers for automotive end uses (ARB, 2000). As part of the recent 2004 amendments to the Consumer Products Regulation, the Board expanded the prohibition on the use of MeCl, Perc, and TCE to include several more categories, including all General Purpose Degreasers.

The current VOC limit for aerosol General Purpose Degreasers is 50 percent by weight, which has been in effect since 2002. For this regulatory action, we propose to

further reduce the VOC content limit for aerosol General Purpose Degreasers based on recent research and review of available technologies.

Table VI-21 below summarizes the sales and emissions from aerosol General Purpose Degreasers based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-21, aerosol General Purpose Degreasers have estimated VOC emissions of almost one ton per day (1,958 pounds per day) in California.

Table VI-21
General Purpose (aerosol) Degreasers*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Aerosol	103	4,240	1,958

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

As shown in Table VI-21 this category contains 103 products with sales of 4,240 pounds per day. The sales weighted average VOC content is about 46 percent.

Product Use and Marketing:

The aerosol General Purpose Degreaser category includes a wide variety of products for use in household, automotive, and commercial settings. General Purpose Degreasers are used for degreasing a wide variety of surfaces in the household kitchen and garage, as well as commercial and institutional settings such as restaurants, hospital kitchens, automotive shops, machine shops, and many more janitorial and commercial settings. They can be used to wipe smooth surfaces such as walls or appliance surfaces to remove grease; they can also be used to degrease machine or equipment parts, or for removing grease from plumbing or pipe-fittings.

These products can be purchased through many sales outlets including grocery stores, discount stores, wholesalers, mass merchandisers, hardware stores, warehouse stores, and home centers. General Purpose Degreasers are also sold to industrial or institutional users through distributors or through direct sales by the manufacturer.

More detailed information on product use and marketing can be found in the "Initial Statement of Reasons for the Proposed Amendments to the Consumer Products Regulation," (Staff Reports) for the "Mid-term I Measure" Amendments and "Mid-term II Measure" Amendments (ARB, 1997; ARB, 1999).

Proposed VOC Limit and Compliance

The proposed VOC limit for aerosol General Purpose Degreasers is 10 percent by weight, effective December 31, 2008. As shown in Table VI-22, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 1,394 pounds per day or 0.70 tpd.

Table VI-22 also shows that 3 percent of the market currently complies with the proposed 10 percent VOC limit for aerosol products. It should be noted that about one percent of the complying market share consists of products with at least one chlorinated ingredient. We are now aware of additional products that have been introduced to the California market and comply with the proposed 10 percent limit (Kyzen, 2006).

Table VI-22
General Purpose Degreasers (aerosol) Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Aerosol	10	21	3.1	1,394

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

The proposed 10 percent by weight VOC limit is largely based on results of a research project funded by ARB. The goal of the research was to demonstrate that technologies used to comply with the South Coast Air Quality Management District's (SCAQMD) Rule 1171 could be transferred, developed, and repackaged into low VOC and non-toxic aerosol automotive products. Rule 1171 limits the level of VOCs in solvent cleaning products to 25 grams per liter (Rule,1171).

In 2003, the Institute for Research and Technical Assistance (IRTA) with assistance from a Technical Review Committee (TRC) undertook the project. The TRC consisted of government agencies, environmental organizations, automotive repair shops and facilities, product formulators and manufacturers. Working with the TRC, IRTA was able to demonstrate effective aerosol automotive maintenance products, including General Purpose Degreasers. The products were used by technicians at several automotive maintenance facilities. Under these "real world" scenarios the technicians found the products to perform as well, or nearly as well as, existing products.

The IRTA Study was reviewed and approved by the Research Screening Committee. The Board's legislatively mandated Research Screening Committee consists of scientists, engineers, and others knowledgeable, technically qualified, and experienced in air pollution problems. The Committee meets approximately four times a year to review proposed and completed research projects.

The products that performed well had no more than 10 percent VOC by weight. Products that were effective were based on the following technologies: LVP-VOC (including methyl esters), alkaline cleaning, surfactant, and/or exempt VOC solvents. Typical propellants that were effective at delivering the products were hydrocarbons or carbon dioxide. To meet the proposed 10 percent VOC limit, we expect products to use these technologies. The findings from the IRTA project are consistent with ARB staff's research on available reformulation technologies.

Issues:

1. **Issue:** The proposed VOC limit is not technologically or commercially feasible for most General Purpose Degreasers.

Response: Survey data show that there are products currently able to meet the limit. As explained in the "Proposed VOC Limit and Compliance" section, ARB contracted with IRTA to show that non-toxic, low VOC alternatives can be formulated at the proposed limit and perform comparably to existing products.

2. **Issue:** ARB staff should not use the IRTA study as proof of low VOC capability because the study is flawed in concept and execution.

Response: ARB staff disagrees with the comment. The draft final report was reviewed and approved by ARB's Research Screening Committee, a panel of independent, distinguished scientists. ARB staff is also aware of products recently introduced to the market, and other products about to be introduced to the market that already comply with the proposed 10 percent VOC limit.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board. Final Statement of Reasons, Public Hearing to Consider the Airborne Toxics Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities. August 27, 2000. (ARB, 2000)

3. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures I. June 6, 1997. (ARB, 1997)

4. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation: Midterm Measures II. September, 10, 1999. (ARB, 1999)

5. Institute for Research and Technical Assistance (IRTA). Safer Alternatives to Solvent Aerosol Automotive Products. December, 2004. (IRTA, 2004)

6. Kyzen Corporation. Product Bulletin: Kyzen Cyber Solv. September, 2006. (Kyzen, 2006)

L. Laundry Starch/Sizing/Fabric Finish Product

Product Category Description:

Products in the "laundry starch/sizing/fabric finish product" category are designed to impart a crisp, fresh look to fabric articles, and to make ironing easier. In addition, the products may also help the fabric resist soiling, make laundering easier, and may extend the life of the fabric. Starch products are generally used for cotton fabric, while sizing/fabric finish products are generally used for synthetic fabrics. Some sizing/fabric finish products may also be suitable for cotton. Products in the "laundry starch/sizing/fabric finish product" category are applied to fabric articles either during or after laundering. The non-aerosols (liquids and dissolved solids) are used in washing machines or by hand-rinse, while the aerosols are manually applied during the ironing process (ARB, 1991b; SDA 2006).

Laundry starch/sizing/fabric finish products were regulated under Phase II of the Consumer Products Regulation adopted on January 9, 1992, and a description of these products is also included in the staff report for that item. At that time, the Board adopted as staff had recommended, a 5 percent VOC limit for these products, applicable to all product forms (i.e. both aerosol and non-aerosol), which was effective on January 1, 1995 (ARB, 1991b; ARB, 1992, FSOR).

Table VI-23 below summarizes the sales and emissions from laundry starch/sizing/fabric finish product, based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-23, the aerosol form was the main contributor of VOC emissions, while the non-aerosol products, with very low VOC content, dominated product sales by weight.

Table VI-23
Laundry Starch/Sizing/Fabric Finish Product *

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Aerosol	14	46,600	2,220
Non- Aerosol	34	1,119,000	14
Total	48	1,166,000	2,230

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

Products in the "laundry starch/sizing/fabric finish product" category are used by both household consumers and commercial/institutional users. While the aerosol products are mainly used by household consumers, the non-aerosol products are mainly used by the commercial/institutional users (ARB, 2003). The commercial/institutional laundries include laundries serving individual or business customers, and in-house laundries within businesses and institutions.

The aerosol products are sprayed onto cleaned laundry, followed by ironing of the fabric to smooth the fabric and set the starch or finish. The aerosol can is designed for optimum operation when positioning up to approximately 45 degrees from vertical, for spray application to articles placed on an ironing board or table. (Faultless, 2006a)

The non-aerosol products are liquid or solid products used in commercial/institutional washing machines. Products are typically applied to laundry by a dispensing mechanism.

For consumer hand washing, non-aerosol products may be applied to laundry using a small basin.

Products are sold in supermarkets, general merchandise stores, drug stores, hardware stores, maintenance/laundry supply warehouses, and through the internet. The aerosol products are typically sold alongside other laundry products, such as detergent and fabric softener, to household consumers. Non-aerosol products are similarly available. For commercial and institutional laundry operators, non-aerosol products are available in bulk quantities, either in dry (solid) or liquid form.

Product Formulation:

Laundry starch products are typically composed of modified vegetable starch (corn, but also rice or wheat), an ironing aide such as silicone, surfactant (wetting agent), water, and for aerosol products -- hydrocarbon propellant and rust inhibitor. Other ingredients used, for cosmetic appeal, include bluing agents, optical enhancers, and fragrance. Borax may be used to reduce scorching from the hot iron. Besides easing ironing, the silicones may also reduce material buildup on the iron soleplate. The starch products are absorbed and bind to fabrics of natural fibers such as cotton, linen, and cotton blends. The propellant in aerosol products consists of conventional liquefied hydrocarbon gases (SCA 2006; Schiff, 2006; ARB 2003).

Since starch does not bind well to synthetic fabrics or blended fabrics with a high synthetic content, other ingredients are used in the sizing/fabric finish products to facilitate binding. Sodium carboxymethylcellulose is a common binding agent ingredient used in aerosol products. Polyvinyl acetate (PVA) is also used in sizing/fabric finish. PVA mainly attaches to the outside surface of synthetic fibers and is not absorbed. Sizing/fabric finishes were developed for fabric blends and polyesters with tighter

weaves, special finishes, and the need to replace the "sizing" in the fabric when new. Sizing refers to closing the pores of fabrics by covering the surface. Compared with sizing products, fabric finish products may provide a heavier finish (SDA 2003; Schiff, 2006; Faultless, 2006b; ARB, 1991b).

Essentially all VOC emissions in this category are due to the hydrocarbon propellants, used only in the aerosol products.

Proposed VOC Limit and Compliance:

The proposed VOC limit for "laundry starch/sizing/fabric finish product" is 4.5 percent by weight for all product forms, effective December 31, 2008. As shown in Table VI-24, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 120 pounds per day or 0.06 tons per day.

Table VI-24 also shows that 0.6 percent of the aerosol market currently complies with the proposed 4.5 percent VOC limit. Since all non-aerosol products comply, and all are substantially below the proposed 4.5 percent VOC limit, they will not be affected by the proposal, will not need any reformulation, and will provide no emission reduction.

Table VI-24
Laundry Starch/Sizing/Fabric Finish Product Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Aerosol	4.5	2	0.6	120
Non-Aerosol	4.5	34	100	None
Total (All)				120

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

As previously discussed, the hydrocarbon propellant in the aerosol products contributes essentially all of the VOC emissions from this category. The proposed 4.5 percent VOC limit is designed to minimize the amount of hydrocarbon propellants used, while still allowing for adequate aerosol spray function. Adequate spray function includes production of a suitable spray pattern without actuator/valve clogging, "sputtering," or dripping problems, and having sufficient propellant to empty the product from the container. Two products reported in the 2003 survey, representing 0.6 percent of the aerosol market, comply with the proposed 4.5 percent VOC limit. This indicates that a 4.5 percent hydrocarbon propellant content, and hence a 4.5 percent VOC limit, is sufficient for aerosol performance. With the proposal, we also believe that the use of much more expensive substitute propellants, such as HFC-152a (exempt), is not necessary.

Issues:

1. **Issue:** A 0.6 percent complying market share for the aerosol products, as reported in the 2003 survey, does not support the (originally) proposed limit of 4 percent VOC. Historical data show a product category with a declining market and declining VOC emissions. The current 5 percent VOC limit allows just enough propellant to empty the container. A lower VOC limit would also increase problems with clogged valves.

Response: While the complying market share is relatively low, it is only one of various considerations used to determine commercial and technical feasibility. Within this category for example, there are two distinct aerosol products, reported in the 2003 survey, that do comply with the (originally) proposed 4 percent VOC limit. To help minimize problems concerned with emptying the container and clogged valves, we have raised the proposed VOC limit to 4.5 percent. While sales may be declining, this category is still important with substantial sales remaining. We believe the proposal is commercially and technologically feasible, through adjustment of the aerosol products to accommodate less hydrocarbon propellant, and with more comprehensive public education about product use.

2. **Issue:** A requirement to reduce the level of propellants in aerosol products will result in more customer complaints, concerning failure to empty the can and with actuator/nozzle clogging.

Response: We understand the desire to include enough propellant to help offset customer misuse, and to reduce customer complaints. We have accordingly raised the proposed VOC limit to 4.5 percent. It may also be necessary to adjust the actuator/valve dimensions to accommodate the new formulation containing less propellant.

3. **Issue:** For aerosol products, the ARB should consider a VOC limit of 4.5 percent.

Response: After further consideration, we have raised the VOC limit, as requested. See Responses 1 and 2 above.

4. **Issue:** The non-aerosol products should be regulated with the aerosol products, and not separately regulated. There is little or no reduction potential in establishing a separate limit for this form.

Response: We do not intend to separate the non-aerosol products from the aerosol products in terms of the VOC limit, which is to remain one limit for "all product forms." We presented data separately for the non-aerosols and aerosols for informational purposes, because combining the data would be very misleading. With

the proposal as discussed above, from the non-aerosols there is no need for the non-aerosols to reformulate and no emission reduction expected.

5. **Issue:** Regarding the category definition, the words "designed for" should be removed, since all products labeled for the uses in this category are designed for those uses.

Response: We agree that the words "designed for" are not needed and should be removed. For clarification, we have replaced the words "designed for" with the words "labeled for."

REFERENCES

1. Air Resources Board. Technical Support Document. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991b)

2. Air Resources Board. Final Statement of Reasons for Rulemaking, Public Hearing to Consider the Adoption of Amendments to the Regulation for Reducing Volatile Organic Compound Emissions from Consumer Products -- Phase II. January 9, 1992. (ARB, 1992, FSOR)

3. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

4. Faultless Starch / Bon Ami Company. "Six Steps To Spray Starch Success." "http://www.faultless.com/PDF/howTostarch2.pdf July, 24, 2006 (Faultless, 2006a)

5. Faultless Starch / Bon Ami Company. "The Faultless Fabric Care Handbook." (English) pp 7-9. http://www.faultless.com/fabric.htm July 21, 2006. (Faultless, 2000b)

6. Schiff, Nathan Ph.D. "All About Starch." http://www.schiff-consulting.com/LAUNDRYSTARCH.htm July 21, 2006. (Schiff, 2006)

7. The Soap and Detergent Association. "Facts About Laundry -- Types of Laundry Products." http://www.cleaning101.com/laundry/fact/fact_sheet4.html January 17, 2006. (SDA, 2006)

M. Oven Cleaner (non-aerosol)

Product Category Description:

Oven Cleaners are defined in the regulation as "any cleaning product designed to clean and to remove dried food deposits from oven walls." We are proposing to amend the definition for Oven Cleaner as follows: "Oven Cleaner" means any cleaning product labeled to clean soils or remove food deposits from oven walls or associated surfaces, including grills, drip pans, or oven racks. Oven Cleaner does not include products labeled exclusively to clean grills, microwave ovens, stovetops, or cooktops.

Results of the 2003 Survey indicate that many oven cleaners are designed for use on grills as well as ovens. However, products labeled only for grill cleaning were deferred from the 2003 Survey. As a result, grill cleaning only products are not included in this category. In addition, this category does not include products specifically used to clean microwave ovens, and/or stovetops/cooktops. After referencing the Technical Support Document for "Phase I" (ARB, 1990a), and evaluating product label claims and formulation data, we believe that products labeled to primarily clean soils from microwave ovens or stovetops/cooktops meet the definition of "General Purpose Cleaner," as defined in section 94508(a) of the Consumer Products Regulation.

Oven Cleaners were regulated under "Phase I" of the Consumer Products Regulation adopted in October of 1990. At that time, the Board adopted an 8 percent by weight VOC limit for aerosol and pump spray products and a 5 percent by weight VOC limit for liquids. The effective date for both VOC limits was January 1, 1993. In addition to amending the definition for "Oven Cleaner" to reflect the excluded products described above, we believe technology exists to further reduce VOC emissions from this category. We also have found that technology exists such that "pump spray" Oven Cleaners no longer require a higher VOC limit than "liquid" Oven Cleaners. Because we believe that "non-aerosol" better describes the "pump spray" and "liquid" product form, we intend to modify the Table of Standards, as set forth in section 94509(a), to reflect this change.

Table VI-25 below summarizes the sales and emissions from non-aerosol (liquid and pump spray) Oven Cleaners based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-25, non-aerosol Oven Cleaners (liquid and pump spray) emitted an estimated 0.3 tons per day of VOCs (510 pounds per day) in California in 2003.

Table VI-25
Oven Cleaner (non-aerosol)*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Liquid	76	13,660	326
Pump Spray	24	6,612	184
Total	100	20,272	510

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

As shown in Table VI-25, this category contains 76 liquid oven cleaning products with sales of 13,660 pounds per day. The sales-weighted average VOC content is about two percent for liquid Oven Cleaners. This category also contains 24 pump spray Oven Cleaners with sales of 6,612 pounds per day. The sales-weighted average VOC content for pump spray Oven Cleaners is about three percent.

Product Use and Marketing:

Oven Cleaners are used in homes, institutional facilities, and in commercial facilities, such as bakeries and restaurants. These products are used to clean and remove carbonized food and other soils and to maintain a safe and functional oven. Use of ovens that are not properly maintained can result in fires. While there are products designed specifically for cleaning ovens, an increasing number of consumers are routinely cleaning their grills, oven racks, drip pans, and other oven accessories with oven cleaners.

These products are sold through a variety of sales outlets including supermarkets, home centers, grocery stores, drug stores, and by mass merchandisers. Oven Cleaners are also sold to commercial or institutional users through distributors or through direct sales by the manufacturer.

Non-aerosol Oven Cleaners are usually applied by either pump spray or as a paste. Thickening agents are added to the liquid forms to promote adhesion of the cleaner to vertical oven surfaces. Most products suggest placing newspaper on the floor and warn against allowing the cleaner to contact painted surfaces. Some cleaners in this category direct users to preheat the oven prior to cleaning. However, most cleaners advise the users to turn off the oven and the pilot light prior to product application. After application, the product is generally allowed to "work" for up to 20 minutes before wiping off with a damp cloth.

Product Formulation:

Oven Cleaners consist of both caustic and non-caustic formulations. Caustic formulations typically contain potassium hydroxide or sodium hydroxide as the active agent, with surfactants such as sodium xylene sulfanate and solvents suspended in an emulsion. Solvents are commonly a glycol ether (2-butoxyethanol) and alcohol. The solvent's function is to solubilize grease and carbonized food deposits. This allows the caustic ingredient to penetrate the food soils to form soap, which is later wiped off with a damp cloth. Caustic formulations work with or without heat. The application of heat speeds up the reaction between the caustic ingredient and the fatty acids contained in grease deposits, resulting in a quicker cleaning process.

Non-caustic formulations require higher temperatures and usually contain ethanolamine/monoethanolamine, ethylene glycol ethers, or weak alkaline salt as the active ingredients. These formulations are lower in VOC content than the caustic ones (ARB, 1990a).

Proposed VOC Limit and Compliance:

The proposed VOC limit for non-aerosol Oven Cleaners is one percent by weight, effective December 31, 2008. As shown in Table VI-26, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 188 pounds per day or 0.09 tons per day.

Table VI-26 also shows that over 25 percent of the market currently complies with the proposed one percent VOC limit for non-aerosol Oven Cleaners.

Table VI-26
Oven Cleaner (non-aerosol) Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Non-Aerosol	1	50	25.6	188

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV).

The proposed one percent VOC limit is designed to further reduce VOC emissions from this category. We expect manufacturers of non-complying products to reformulate using LVP-VOC glycol ethers such as diethylene glycol monobutyl ether or tripropylene glycol methyl ether in place of 2-butoxyethanol.

Issue:

1. Issue: Products designed specifically for cleaning grills should not be included in this category because "grill cleaners" were deferred from the 2003 Consumer Product Survey.

Response: We agree and are not proposing to include them in the Oven Cleaner category.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

.2. Air Resources Board. Technical Support Document, Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products: Phase I. August, 1990. (ARB, 1990a)

N. Sanitizer Category

Product Category Description:

Sanitizer is defined as any product that is registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.) and is labeled to reduce, but not necessarily eliminate, microorganisms in the air, on surfaces, or on inanimate objects. "Sanitizer" includes food contact and non-food contact products. "Sanitizer" does not include (A) "Disinfectant," (B) products labeled solely for use on humans or animals, (C) products labeled solely for agricultural use, (D) products, which are subject to a VOC limit under another regulated category in section 94509(a), as dictated by the primary use indicated on the principal display panel.

To make anti-microbial pesticide claims a sanitizer must be registered with the U.S. Environmental Protection Agency (U.S. EPA) according to FIFRA requirements and with the California Department of Pesticide Regulation. Sanitizers are designed to reduce pathogenic microorganisms to acceptable levels in the air and on surfaces. Surface sanitizers are applied after surfaces have been cleaned of any organic debris.

The Health and Safety Code 41712 (e)(1) directs the Air Resources Board to consider recommendations from health agencies (local, State, or federal) regarding regulation of health benefit products. This process was put in place to ensure that public health would not be compromised by regulating VOC content of such products. Because sanitizers are considered health benefit products, staff consulted with the California Department of Health Services (DHS) to discuss the proposed VOC limits and receive their expert advice as to whether adopting the proposed VOC limits would affect product efficacy. Staff is continuing to work with DHS staff to ensure that the proposed limits do not adversely impact the efficacy of Sanitizers.

Table VI-27 below summarizes the sales and emissions from sanitizers based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). As shown in Table VI-27, sanitizers are sold in both aerosol and non-aerosol forms, with the non-aerosol form dominating the market in terms of sales. However, the aerosol products contribute approximately 75 percent of the VOC emissions from this category. Sanitizers contribute about 1.9 tons of VOC emissions per day (3,760 pounds per day) in California. The sales weighted average VOC content for aerosol products is 93.3 percent by weight and 1.6 percent by weight for non-aerosol products, after the label specified dilution takes place.

Table VI-27
Sanitizers*

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Aerosol	6	3,020	2,820
Non-aerosol	139	43,852	940
Total	146	46,872	3,760

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003) with 2005 updated sales for some aerosol products.

** Survey emissions adjusted for complete market coverage (see Chapter IV).

Product Use and Marketing:

The sanitizer category consists of aerosol and non-aerosol products. Generally, non-aerosol sanitizers are divided into food-contact and non-food contact surface sanitizers.

Most aerosol sanitizers are air sanitizers designed to reduce airborne bacteria. FIFRA requires performance tests based on the type of active ingredients in air sanitizers. For products that contain glycols (triethylene, dipropylene, or propylene glycol) efficacy requirements are met by the chemical formula statement showing 5 percent glycol content. For aerosol sanitizer products that contain active ingredients other than glycols (e.g. alcohol) testing must be performed using an air sampling device, to demonstrate 99.9 percent reduction of *Staphylococcus aureus* and *Klebsiella pneumoniae* in the air. If the product is intended for use in hospital or medical settings, tests with *Pseudomonas aeruginosa* are also required (U.S. EPA, 1980).

Additionally, many aerosol sanitizers make odor removal claims along with sanitizing claims. Aerosol sanitizers are used in hospitals, schools, offices, public buildings, and in homes.

Non-aerosol sanitizers are designed for use on surfaces. Surfaces must be cleaned of most organic matter, because organic matter may deactivate the active

ingredients (Maintenance, 2002). Most products are diluted, applied to a pre-cleaned surface and allowed to set for a specified amount of time (1 – 10 minutes based on the 2003 survey data), before wiping or rinsing. Sanitizers must remain on the surface for the specified contact time to be effective.

Food contact non-aerosol sanitizers are applied to surfaces where contact with food may occur. FIFRA requires all food-contact surface sanitizers to demonstrate a 99.999 percent reduction in the number of microorganisms within 30 seconds. The specific test organisms are *Escherichia coli* and *Staphylococcus aureus* (U.S. EPA, 1979).

Non food-contact non-aerosol sanitizers are typically applied to walls and floors. FIFRA requires all non food-contact surface sanitizers to demonstrate a 99.9 percent reduction in the number of microorganisms within 5 minutes. The specific test organisms are *Staphylococcus aureus* and *Klebsiella pneumoniae. Enterobacter aerogenes* may be substituted for *Klebsiella pneumoniae* (U.S. EPA, 1976).

Based on our 2003 survey data most of the non-aerosol sanitizers are liquid products that require dilution with water. Additional product forms include, foam, and mist spray dispensed via a non-pressurized system. Products requiring dilution must be diluted in accordance with label directions for effective sanitizing, which is also a FIFRA requirement (Maintenance, 2002).

Aerosol sanitizers are primarily sold to household consumers, whereas non-aerosol sanitizers are sold primarily to commercial, industrial, and institutional establishments. Sanitizers are sold at warehouse, janitorial, supermarket, hardware, and convenience stores.

Product Formulation:

The VOC ingredients in aerosol sanitizers are primarily ethanol, isopropanol and hydrocarbon propellants (propane, isobutane, and isopentane). The alcohols and glycols, such as triethylene glycol and propylene glycol comprise the active ingredients in aerosol formulations. (ARB, 2003) The glycols comprise some of the low vapor pressure (LVP-VOC) ingredients. Based on the 2003 survey data, the total VOC content of aerosol sanitizers ranges from 68.6 to 93.9 percent by weight.

The VOC ingredients in non-aerosol sanitizers are ethanol, isopropanol and 2-butoxyethanol (ARB, 2003). In addition to alcohols, quaternary ammonium compounds (quats) and phenolics comprise the active ingredients. The total VOC content of non-aerosol sanitizers ranges from 0 to 59 percent by weight. (ARB, 2003)

Proposed VOC Limit and Compliance:

The proposed VOC limits for sanitizers are 70 percent by weight for aerosol products, and 1 percent by weight for non-aerosol products, effective

December 31, 2008. To allow the time necessary for FIFRA registration requirements, the effective date of the VOC limits for sanitizers is one year after the date proposed, as specified in section 94509(d) of the Consumer Products Regulation. This means the effective date would be December 31, 2009. The sell-through period also starts one year after the proposed date, as specified in section 94509(d).

In consulting with medical experts in the field of public health and the industry that formulates these products we have determined that the proposed limits will ensure that products will achieve the same level of disinfection. Public health would not be compromised.

As shown in Table VI-28 the proposed limits for sanitizers will result in an estimated reduction of 1,584 pounds per day, or approximately 0.79 tpd.

Table VI-28 also shows that no products currently comply with the proposed 70 percent VOC limit for aerosol products and 92 percent of the market currently complies with the 1 percent limit for non-aerosol products. We also note that industry stakeholders, who manufacture these products, have agreed that the proposed VOC limits are achievable while maintaining equivalent efficacy to existing products. The VOC limit for the non-aerosol sanitizer is applied after the product is diluted, as specified on the label. When multiple dilutions are specified, the VOC limit would apply toward the highest concentrated product dilution.

Table VI-28
Sanitizer Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Aerosol	70	0	0	920
Non-aerosol	1	123	92	664
Total				1,584

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003) with 2005 updated sales for some aerosol products.

** Survey emissions adjusted for complete market coverage (see Chapter IV).

Reformulation options that could be used by manufacturers to meet the proposed VOC limit include:

(a) Reduction of alcohol level for both aerosol and non-aerosol forms.

(b) Changing the level of non-alcohol active ingredients, such as quaternary ammonium compounds and glycols, to help offset a reduction in alcohol.

(c) Reduction of VOC propellant level, and/or substitution of part or all of VOC propellant with non-VOC propellant (e.g. carbon dioxide).

The staff concludes that the proposed 70 percent limit for aerosol sanitizers and 1 percent limit for non-aerosol sanitizers would result in products that continue to provide the necessary air and surface sanitizing properties.

Issues:

1. **Issue:** These products must remain effective for all types of surfaces because they are health benefit products.

Response: ARB staff agrees and in accordance with State law, has consulted with the California Department of Health Services and the sanitizer industry to ensure that the proposed VOC limits are achievable while maintaining the same level of efficacy.

2. **Issue:** CSPA member companies manufacturing these important health-benefit products believe that the 70 percent and 1 percent limits proposed may be technologically and commercially feasible. Therefore CSPA supports adoption of 70 percent for aerosol form and 1percent for non-aerosol form VOC limits for this category.

Response: Comment noted. Staff agrees that the proposed limits are commercially and technologically feasible.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board. Staff Report. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991a)

3. Air Resources Board. Technical Support Document. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991b)

4. Air Resources Board. Appendices. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October, 1991. (ARB, 1991c)

5. Air Resources Board. Final Statement of Reasons for Rulemaking, Public Hearing to Consider the Adoption of Amendments to the Regulation for Reducing Volatile Organic Compound Emissions from Consumer Products -- Phase II. January 9, 1992. (ARB, 1992, FSOR)

6. Maintenance Supplies. "Term-inate Germs in the Restroom." Volume 47 No. 08, pp. 22-24. August, 2002. (Maintenance 2002)

7. U.S. Environmental Protection Agency. "Sanitizer Test for Inanimate Non-Food Contact Surfaces: Efficacy Data Requirements." DIS/TSS-10 http://www.epa.gov/oppad001/dis_tss_docs/dis-10.htm, 1976. (U.S. EPA, 1976)

8. U.S. Environmental Protection Agency. "Sanitizing Rinses for Previously Cleaned Food-Contact Surfaces: Efficacy Data Requirements". DIS/TSS-4 http://www.epa.gov/oppad001/dis_tss_docs/dis-04.htm, January 30, 1979. (U.S. EPA, 1979)

9. U.S. Environmental Protection Agency. "Air Sanitizers: Efficacy Data and labeling Requirements." DIS/TSS-11 http://www.epa.gov/oppad001/dis_tss_docs/dis-11.htm, September 3, 1980. (U.S. EPA, 1980)

O. Temporary Hair Color

Product Category Description:

Temporary hair color products are labeled to apply a temporary layer of color or glitter to human hair or animal fur. This category includes glow-in-the-dark and black-light-activated products. These products are different from demi-permanent, semi-permanent, and permanent hair dyes because they are not intended to last for more than one shampoo or to penetrate the hair cuticle. Only the aerosol product form will be considered herein.

A closely related category, Hair Spray, was originally regulated under "Phase I" of the consumer products regulation adopted in October of 1990, and a description of these products is also included in the staff report for that item (ARB, 1990a). At that time, the Board adopted a Tier I standard of 80 percent VOC, effective on January 1, 1993 and a Tier II standard of 55 percent VOC that ultimately became effective June 1, 1999 (ARB, 1997). Discussions between ARB staff and manufacturers prompted many aerosol temporary hair color manufacturers to change their labeling by removing style-finishing claims, in order to avoid being subject to the Hair Spray VOC limit. Indeed, at the time, many temporary hair color aerosol sprays made holding claims consistent with hair sprays' claims.

Table VI-29 below summarizes the sales and emissions from temporary hair color based on the results of the ARB's 2003 Consumer and Commercial Products Survey (ARB, 2003). Although temporary hair color is sold in many product forms, only the aerosol form was surveyed in this regulatory effort. Temporary hair color is responsible for estimated VOC emissions of about 0.30 tons per day (592 pounds per day) in California.

Table VI-29
Temporary Hair Color

Product Form	Number of Products	Category Sales (lbs/day)	Adjusted VOC Emissions (lbs/day)**
Aerosol	30	624	592

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).

** Survey emissions adjusted for complete market coverage (see Chapter IV). The market coverage adjustment for temporary hair color was 25 percent; staff believes the survey covered 75 percent of the market.

Product Use and Marketing:

Aerosol temporary hair color is applied by holding the container 6-10 inches away and spraying dry, styled hair with short bursts of spray until the desired coverage is achieved. Most labels direct the user to apply temporary hair color only after styling, and warn against further heat styling after application. To remove the products, label instructions suggest combing through the hair to remove as much of the product as possible, then shampooing as usual. Some labels warn that staining may occur on blonde or white hair.

One foaming aerosol mousse product was reported in the 2003 Survey, and is used similarly to the aerosol sprays.

Temporary hair color aerosols are commonly used as novelty products by general consumers for holidays or special occasion costumes, by nightclubbers or partygoers, by thespians, and by sports fans. They are also used by pet owners to enhance the color of their pet's coat, perhaps prior to a show or competition.

Temporary hair color products are sold in a variety of retail outlets, including: mass-merchandiser retail chain stores, beauty supply stores, costume shops, novelty shops, party supply stores, seasonal specialty shops (such as shops only open for the Halloween season) and the Internet. While sales for these products peak near Halloween, they are available, purchased, and used year-round.

Product Formulation:

Temporary hair color aerosol formulas are typically quite similar to hair spray formulas used prior to the adoption of VOC standards for Hair Spray. The products are typically composed of propellant, ethanol, and resins or polymers, just like hair sprays. The color products, however, contain a small percentage of pigments or glitter in addition to the other components.

Proposed VOC Limit and Compliance:

The proposed VOC limit for the aerosol form of Temporary Hair Color, is 55 percent by weight, effective December 31, 2010. As shown in Table VI-30, using adjusted 2003 emissions, the proposed limit will result in an estimated emission reduction of 250 pounds per day or 0.13 tons per day.

The percent complying market share has been withheld from Table VI-30 to protect the confidentiality of the one aerosol mousse product that is currently compliant with the proposed limit. None of the reported aerosol temporary hair color sprays are currently compliant with the proposed limit. A similar situation occurred when the 55 percent limit for Hair Spray was proposed.

Table VI-30
Temporary Hair Color Proposal*

Product Form	Proposed VOC Limit (wt. %)	Complying Products	Complying Market Share (%)	Emissions Reductions (lbs/day)**
Aerosol	55	1	***	250

* Based on 2003 Consumer and Commercial Products Survey (ARB, 2003).
** Survey emissions adjusted for complete market coverage (see Chapter IV). The market coverage adjustment for temporary hair color was 25 percent; staff believes the survey covered 75 percent of the market.
*** Data withheld to protect confidentiality.

Manufacturers could comply with the limit by using exempt propellants, or changing to water-based formulations with water-compatible propellant and resin systems, two options that have been used to successfully formulate compliant hair sprays. Aerosol temporary hair color products currently use resins such as PVP/VA copolymer, which was a popular resin system in hair sprays prior to the adoption of lower VOC standards in the early 1990s, and is still used in some compliant hair spray formulations today. Another popular resin in aerosol temporary hair colors, polyvinylcaprolactam, is also mentioned for use in 55 percent VOC hair spray formulations in manufacturer's technical bulletins (BASF). In general, hair sprays have shifted to octylacrylamide/acrylates/butylaminoethyl methacrylate copolymer, amongst others, in 55 percent VOC formulations. Based on the similarities between temporary hair color aerosols and hair spray formulations prior to VOC regulations, it is assumed that temporary hair color aerosols could follow similar reformulation pathways.

Issue:

1. **Issue:** Changing polymer/solvent systems and propellant systems will require significant time and effort to accomplish effectively. Please consider delaying the effective date to allow for these transitions.

Response: Staff acknowledges these challenges and, therefore, proposes an effective date of December 31, 2010.

REFERENCES

1. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

2. Air Resources Board, Staff Report. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products: Phase I. August, 1990. (ARB, 1990a)

3. Air Resources Board, Final Statement of Reasons for Rulemaking, Including Summary of Comments and Agency Responses: Public Hearing to Consider the Adoption of Amendments Pertaining to Hairspray in the California Consumer Products Regulation. March 1997. (ARB, 1997)

4. BASF. BASF Cosmetic Solutions: Styling polymers/hair setting resins. http://www.cosmetics.basf.de/formulation_detail.aspx?GrpID=29&FID=01_00972 p. 11. (BASF)

VII.

ECONOMIC IMPACTS

A. INTRODUCTION

This Chapter discusses the estimated economic impacts we anticipate from implementation of the 18 proposed new VOC limits (there are 15 categories; 18 limits when subcategories and form specific limits are counted) and other proposed changes to the regulations. In general, economic impact analyses are inherently imprecise by nature, given the unpredictable behavior of companies in a highly competitive market such as consumer products. While staff has quantified the economic impacts to the extent feasible, some projections are necessarily qualitative and based on general observations and facts known about the consumer products industry. This impacts analysis, therefore, serves to provide a general picture of the economic impacts typical businesses subject to the proposed limits might encounter; we recognize individual companies may experience different impacts than projected.

The overall impacts are first summarized, followed by a more detailed discussion of specific aspects of the economic impacts in the sections listed below:

- **B.** Economic Impacts Analysis on California Businesses;
- **C.** Analysis of Potential Impacts to California State or Local Agencies;
- **D.** Analysis of the Cost-Effectiveness (C.E.) of the Proposed Limits;
- **E.** Analysis of the Impacts to Raw Materials Cost;
- **F.** Analysis of the Combined Impacts on Per-Unit Cost from Recurring and Nonrecurring Costs;
- **G.** Other Possible Economic Impacts; and
- **H.** Mitigation of Potential Impacts through Additional Regulatory Flexibility.

It is important to note that we conducted the economic impacts analysis shown in this report to meet the current legal requirements under the Administrative Procedure Act (APA). This analysis uses similar methodologies and assumptions as were used in the last three major consumer products rulemakings, the "Mid-Term Measures" regulations adopted by the Board in 1997, 1999, and in the 2004 Amendments to the regulation. We have used updated methodologies to determine the high cost estimates for nonrecurring costs similar to the procedure we used in the 2004 Amendments. We have determined a likely high cost scenario specific to each category. See Subsection F of this Chapter for a detailed description of the nonrecurring cost determination methodology. The analysis, both here and in the 1997, 1999, and 2004 rulemakings, represent a significant update to and expansion of the methodology we used to conduct the cost-effectiveness analyses for the original Phase I-II consumer products rulemakings (ARB, 1990; ARB, 1991).

Summary of Findings

Overall, most affected businesses will be able to absorb the costs of the proposed limits and requirements with no significant adverse impacts on their profitability. This finding is indicated by the staff's estimated change in "return on owner's equity" (ROE) analysis. The analysis found that the overall change in ROE ranges from a low of 1.1 to a high of about 4.9 percent, with an average change in ROE of about 3.4 percent. However, the proposed measures may impose economic hardship on some businesses with very little or no margin of profitability. These businesses, if hard pressed, can seek relief under the variance provision of the consumer products regulation for extensions to the compliance dates. Such extensions may provide sufficient time to minimize the cost impacts to these businesses. Because the proposed measures would not significantly alter the profitability of most businesses, we do not expect a noticeable change in employment; business creation, elimination or expansion; and business competitiveness in California. We also found no significant adverse economic impacts to any local or State agencies.

Our analysis shows that the cost-effectiveness of the proposed amendments are similar to the cost-effectiveness of other existing ARB regulatory programs. We estimate the total overall cost effectiveness of the initial proposed limits and other requirements to be about $2.35 per pound of VOC reduced.

We estimate that the total cost incurred by industry to comply with this regulation is about $20 million per year. These cost estimates are based on assumptions specific to each category depending on reformulation needs, and represent the mid-range of the cost estimates. Staff believes the mid-range costs are the most likely to be incurred by industry to comply with the proposed limits. For some categories, it was assumed that manufacturers would either drop certain products or undergo minor product formulation changes, and for other categories manufacturers would undergo complete production line overhaul and equipment replacement rather than simple re-tooling.

One way to estimate the potential change in product prices is to determine the change in raw materials cost, which generally has the biggest influence on product cost for most product categories. Our analysis indicates that reformulations to comply with the proposed limits can result in raw material changes ranging from negligible cost (net savings or no cost) up to a cost increase of about $0.44 per unit. The value of $0.44 represents the maximum, worst case per-unit cost increase. Again, this range compares favorably to the change in per unit cost projected for the Phase I and II, the Mid-Term Measures I and II regulations and the 2004 Amendments. The analysis assumed the present cost for raw materials; these costs may be lower or higher at the time of the limit effective date depending on the formulations chosen by manufacturers and the future price of raw materials. To the extent that the projected cost savings or increases are ultimately passed on to the consumer, the actual retail price of products after the proposed limits become effective may be higher or lower than suggested by this analysis.

Even if all annualized nonrecurring costs (research and development, capital equipment purchases, etc.) and recurring raw material cost increases are factored into the affected products manufacturing costs, the potential increase in production per-unit costs are comparable to previous ARB consumer product rulemakings. The estimated per-unit cost increases from both annualized nonrecurring and annual recurring costs range from negligible cost (net savings or no cost) to about $2.27 per unit. The value of $2.27 represents the maximum, worst case, per-unit cost increase for a product which is typically packaged in a five gallon container. When averaged over the total number of unit sales in California of noncomplying products, (those that need to reformulate) the product weighted average cost increase is about $0.06 per unit. As noted before, these per unit cost increases compare favorably to the change in per unit cost projected for previous ARB consumer product rulemakings.

B. ECONOMIC IMPACTS ANALYSIS ON CALIFORNIA BUSINESSES

Legal Requirements

Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment must include a consideration of the impact of the proposed regulation on California jobs, business expansion, elimination or creation, and the ability of California business to compete with businesses in other states.

Also, State agencies are required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. The estimate shall include any nondiscretionary cost or savings to local agencies and the cost or savings in federal funding to the State.

Findings

Potential Impact on California Businesses - Overall, most affected businesses will be able to absorb the costs of the proposed measures with no significant adverse impacts on their profitability. However, the proposed measures may impose economic hardship on some businesses with very little or no margin of profitability. These businesses, if hard pressed, can seek relief under the variance provision of the consumer products regulation for extensions to their compliance dates. Such extensions may provide sufficient time to minimize the cost impacts to these businesses. Additional mitigation may be achieved by taking advantage of the compliance flexibility offered by the existing Innovative Product Provision (IPP) and the Alternative Control Plan (ACP) Regulation (see Subsection H of this Chapter). Because the proposed measures would not significantly alter the profitability of most businesses, we do not expect a noticeable change in employment; business creation, elimination or expansion; and business competitiveness in California.

Discussion

This portion of the economic impacts analysis is based on a comparison of the return on owners' equity (ROE) for affected businesses before and after inclusion of the cost to comply with the proposed requirements. The data used in this analysis are obtained from Dun and Bradstreet Industry Norms and Key Business Ratio, the ARB's 2003 Consumer and Commercial Products Survey (Survey), and the staff's cost-effectiveness analysis discussed later in this Chapter.

Affected Businesses

Any business which manufactures or markets consumer products subject to the proposed new limits and requirements can be directly affected by this regulation. Also potentially affected are businesses which supply raw materials or equipment to manufacturers or marketers, and those that distribute or sell consumer products in California. The focus of this analysis, however, will be on manufacturers, marketers, and distributors that are most affected by the proposed measures.

The consumer products subject to the proposed measures are manufactured, marketed, or distributed by a large number of companies worldwide. According to the 2003 Survey, there are over 226 companies that market the affected products in California. These companies manufacture, market, and distribute a broad range of solvent, adhesive, household, and personal care products, including an estimated total of 1,051 complying and 1,046 noncomplying products (based on reported figures). Of the companies manufacturing these products, about 49 firms (mostly medium- or small-sized firms) are located in California.

These 226 companies fall primarily into 5 North American Industry Classification System codes (NAICS). A list of these industries which we have been able to identify is provided in Table VII-1. The industries with the most noncomplying products are Soap and Other Detergent Manufacturing, Polish and Other Sanitation Good Manufacturing, Toilet Preparation Manufacturing and All Other Miscellaneous Chemical Product and Preparation Manufacturing.

Table VII-1
Industries with Businesses Potentially Affected by the Proposed Limits

NAICS*	Industry	Number of Product Categories*	Number of Noncompliant Products**	Includes:
325520	Adhesive Manufacturing	1	34	Construction, Panel and Floor Covering Adhesive
325611	Soap & Other Detergent Manufacturing	2	94	General Purpose Cleaner; Laundry Starch Product
325612	Polish & Other Sanitation Good Manufacturing	7	622	Bath and Tile Cleaner; Disinfectants; Floor Polish and Wax (flexible and nonresilient); Furniture Maintenance Product; General Purpose Degreaser; Oven Cleaner; Sanitizer
325620	Toilet Preparation Manufacturing	1	28	Temp. Hair Color
325998	All Other Miscellaneous Chemical Product & Preparation Manufacturing	4	268	Brake Cleaner; Carb Cleaner; Automotive Windshield Washer Fluid; Engine Degreaser

*As reported in the 2003 Consumer and Commercial Products Survey.
** Some noncomplying products may relate to more than one NAICS code.

Study Approach

This study covers 5 industries with at least 226 affected businesses. The approach used in evaluating the potential economic impact of the proposed measures on these businesses is outlined as follows:

(1) A typical business from each product category was selected from the Survey respondents.
(2) A range of compliance costs were estimated for each affected product category. The mid-range cost for each category was used in this analysis.
(3) Compliance cost to a typical business was then estimated based on a weighted average of all product category costs in an affected industry.
(4) Estimated cost was adjusted for federal and State taxes.
(5) The Return on Owner's equity (ROE) was calculated for each of these businesses by dividing the net profit by the net worth. The adjusted cost was then subtracted from net profit data. The results were used to calculate an adjusted ROE. The adjusted ROE was then compared with the ROE before the subtraction of the cost to determine the potential impact on the profitability of the business. A reduction of more than 10 percent in profitability is considered to indicate a potential for significant adverse economic impacts.

The threshold value of 10 percent has been used consistently by the ARB staff to determine impact severity (ARB 1990; ARB 1991; ARB 1995; ARB 1997; ARB 1999; ARB 2004). This threshold is consistent with the thresholds used by the U.S. EPA.

Assumptions

This study uses 2003-2004 Dun and Bradstreet financial data for a nationwide typical business in each affected industry except for Polish and Other Sanitation Good Manufacturing where 1999-2000 Dun and Bradstreet financial data was used due to lack of relevant financial data. This data was used to calculate the ROEs before and after the subtraction of the compliance costs for a typical business in each industry listed in Table VII-1. The calculations were based on the following assumptions:

(1) A typical business on a nationwide basis in each industry is representative of a typical California business in that industry;
(2) All affected businesses were subject to federal and State tax rates of 35 percent and 9.3 percent respectively; and
(3) Affected businesses are not able to increase the prices of their products, nor can they lower their costs of doing business through short-term cost-cutting measures.

Given the limitation of available data, staff believes these assumptions are reasonable for most businesses at least in the short run; however, they may not be applicable to all businesses.

Results

Typical California businesses are affected by the proposed new limits to the extent that the implementation of these requirements would change their profitability. Based on our assessment of the proposed limits' cost-effectiveness (see Subsection D of this Chapter), we estimate the per-business compliance costs to range from about $940 (low cost for typical non-aerosol Sanitizer manufacturer) to about $68,000 per year (high cost for typical Carburetor or Fuel-Injection Air Intake Cleaner manufacturer,) as shown in Table VII-2.

Table VII-2
Estimated Total Impacts to Businesses from Both Annualized Nonrecurring and Annual Recurring Costs

Category	Estimated # Products Non-Compliant	Number of Companies with Noncompliant Products in Each Product Category	Estimated Annual Costs, Dollars Per Year (Includes Recurring and Nonrecurring)					
			For a Typical Business in the Product Category			For All Businesses in the Product Category		
			Low Cost	High Cost	Mid Cost	Low Cost	High Cost	Mid Cost
Adhesives								
Construction, Panel, and Floor Covering Adhesive	38	11	$1,078	$8,961	$5,020	$11,861	$338,518	$175,190
Total	38					$11,861	$338,518	$175,190
Automotive								
Brake Cleaner								
Aerosol	77	51	$2,116	$27,928	$15,022	$107,903	$2,141,140	$1,124,522
Non-aerosol	24	14	$2,457	$32,438	$17,448	$34,404	$792,929	$413,667
Automotive Windshield Washer Fluid (Type A)	29	22	$1,848	$1,848	$1,848	$40,659	$53,391	$47,025
Carburetor or Fuel-Injection Air Intake Cleaners								
Aerosol	100	43	$27,228	$68,232	$47,730	$1,170,783	$6,823,209	$3,996,996
Non-aerosol	20	12	$13,220	$41,539	$27,380	$158,643	$830,789	$494,716
Engine Degreaser (aerosol)	48	34	$1,978	$26,107	$14,042	$67,244	$1,247,312	$657,278
Total	298					$1,579,537	$11,888,770	$6,734,203
Household Care								
Bathroom & Tile Cleaner (non-aerosol)	81	54	$3,317	$3,317	$3,317	$179,141	$269,080	$224,111
Disinfectant								
Aerosol	0							
Liquid	43	30	$970	$5,755	$3,362	$29,087	$249,377	$139,232
Floor Polish or Wax (flexible)	82	37	$1,059	$6,688	$3,873	$39,168	$549,929	$294,548
Floor Polish or Wax (nonresilient)	212	41	$7,285	$57,496	$32,391	$298,689	$12,201,974	$6,250,331
Furniture Maintenance Product (non-aerosol)	61	29	$2,966	$23,407	$13,187	$86,010	$1,430,456	$758,233
General Purpose Cleaner (aerosol)	33	25	$3,794	$14,618	$9,206	$94,841	$487,272	$291,057
General Purpose Degreaser (aerosol)	91	58	$1,497	$8,067	$4,782	$86,804	$735,024	$410,914
Laundry starch product/ sizing/ fabric finish (aerosol)	91	50	$7,499	$41,220	$24,360	$374,967	$3,755,645	$2,065,306
Oven or Grill Cleaner (non-aerosol)	13	8	$3,681	$3,681	$3,681	$29,448	$49,080	$39,264
Sanitizer	62	28	$1,010	$6,544	$3,777	$28,293	$407,180	$217,737
Aerosol	0							
Non-aerosol	7	2	$1,913	$11,656	$6,785	$3,825	$77,710	$40,767
	18	9	$941	$5,945	$3,443	$8,469	$105,692	$57,080
Total	796					$1,258,742	$20,318,419	$10,788,580
Personal Care								
Temporary Hair Color (aerosol)	107	30	$4,850	$34,183	$19,516	$145,507	$3,646,146	$1,895,826
Total	107					$145,507	$3,646,146	$1,895,826
Grand Total	1238					$2,995,746	$36,191,853	$19,593,800

Table VII-2. Estimated Total Impacts to Businesses from Both Annualized Non-Recurring and Annual Recurring Costs

Using ROE to measure profitability, we found that the average ROE of sample businesses in affected industries declined by about 3.4 percent as shown in Table VII-3. This represents a minor change in the average profitability of typical businesses in California.

Table VII-3
Changes in Return on Owner's Equity (ROEs) for Typical Businesses in Affected Industries

NAICS*	Industry	% Change in ROE
325520	Adhesive Manufacturing	1.1
325611	Soap & Other Detergent Manufacturing	4.3
325612	Polish & Other Sanitation Good Manufacturing	4.9
325620	Toilet Preparation Manufacturing	1.8
325998	All Other Miscellaneous Chemical Product & Preparation Manufacturing	4.7
Average		**3.4**

Note: Changes in ROE mean change or difference; all changes in ROEs shown are negative (i.e., shows a decline in profitability).

As shown in Table VII-3, the projected change in profitability of typical businesses in the 5 affected industries varied widely. Within the NAICS shown, the predicted change (decline) in profitability of a typical business ranged from a high of about 4.9 percent to a low of 1.1 percent. This variation in the impact of the proposed measures can be attributed mainly to two factors. First, some businesses incur higher costs due to the type of products or the number of noncompliant products they manufacture or market. For instance, the estimated annualized costs for typical businesses in each affected industry ranged from a high of approximately $22,000 to a low of about $4,600. Second, the performance of businesses may differ from year to year. Hence, the financial data used may not be representative of an average-year performance for some businesses.

The potential impacts to businesses' ROEs may be overestimated for the following reasons. First, annualized costs of compliance are estimated using, in part, the current prices of raw materials. Raw material prices usually tend to fall as higher demand for these materials induces economy of scale production in the long run. Second, affected businesses probably would not absorb all of the increase in their costs of doing business. They might be able to either pass some of the cost on to consumers in the form of higher prices, reduce their costs, or do both.

In past analyses, nonrecurring costs were allocated to all products in the category, i.e., the costs were spread out over all complying and noncomplying products

that were reported in the survey. In this analysis, as in 2004, we allocated nonrecurring reformulation costs only to the noncomplying products.

Potential Impact on Consumer

The potential impact of the proposed measures on consumers depends upon the ability of affected businesses to pass on the cost increases to consumers. In the short run, competitive market forces may prevent businesses from passing their cost increases on to consumers. Thus, we do not expect a significant change in retail prices in the short run. In the long run, however, if businesses are unable to bring down their costs of doing business they will pass their cost increases on to consumers.

To estimate the price increase, we adjusted per unit compliance costs for each affected industry by its profit margin as provided by Dun and Bradstreet. Assuming affected industries will pass on the entire compliance costs to consumers in terms of higher prices, we estimate the average price of a product would increase by about $0.17 per unit. Product price increases, however, would vary from industry to industry. They would range from a low of $0.03 per unit of the products sold by Adhesive Manufacturing to a high of about $1.57 per unit of the products sold by Toilet Preparation Manufacturing.

The proposed measures may also affect consumers adversely if they result in reduced performance attributes of the products. However, this scenario is unlikely to occur for the following reasons. First, for nearly every proposed limit, there are already complying products that represent significant market share in many of their respective categories. Thus, the industry already has the technology to manufacture compliant products that satisfy consumers. Second, marketers are unlikely to introduce a product which does not meet their consumers' expectations. This is because such an introduction would be damaging not only to the product sale, but also to the sale of other products sold under the same brand name (impairing so-called "brand loyalty"). Finally, the Board has provided flexibility, under the existing consumer products program, to businesses whose situations warrant an extension to their compliance dates. For companies that can justify such variances, the additional time may afford more opportunity to explore different formulation, cost-cutting, performance-enhancing, or other marketing strategies which can help make the transition to new complying products nearly transparent to consumers.

Potential Impact on Employment

The proposed measures are not expected to cause a noticeable change in California employment and payroll. According to the U.S. Department of Commerce, California employment in industries affected by the proposed measures was 15,359 in 2003, as shown in Table VII-4, or about 9.7 percent of national employment in the affected industries. This represents about 0.1 percent of non-farm employment in California. These employees working in the 526 establishments generated about $676

million in payroll, or about 9.2 percent of national payroll in the affected industries. This also accounts for about 0.1 percent of the total California non-farm payroll in 2003.

Table VII-4
California Employment and Payroll in Affected Industries

NAICS	Number of Employees		Payroll	
	California	CA Share as % of US	California (million in 2003$)	CA Share as % of US
325520	2,078	9.9	113,760	11.3
325611	1,980	8.0	74,873	6.8
325612	1,169	6.2	45,478	5.7
325620	7,678	13.0	331,623	12.2
325998	2,454	7.0	675,801	6.5
Total	15,359	9.7	675,801	9.2

Source: 2003 County Business Patterns: The U.S. Department of Commerce, Bureau of the Census.

Potential Impact on Business Creation, Elimination or Expansion - The proposed measures would have no noticeable impact on the status of California businesses. This is because the reformulation costs are not expected to impose a significant impact on the profitability of businesses in California. However, some small businesses with little or no margin of profitability may lack the financial resources to reformulate their products on a timely basis. Should the proposed measures impose significant hardship on these businesses, temporary relief in the form of a compliance date extension under the variance provision may be warranted.

On the other hand, the proposed measures may provide business opportunities for some California businesses or result in the creation of new businesses. California businesses which supply raw materials and equipment or provide consulting services to affected industries may benefit from increased industry spending on reformulation.

Potential Impact on Business Competitiveness - The proposed measures would have no significant impact on the ability of California businesses to compete with businesses in other states. Because the proposed measures would apply to all businesses that manufacture or market certain consumer products regardless of their location, the staff's proposal should not present any economic disadvantages specific to California businesses.

Nonetheless, the proposed measures may have an adverse impact on the competitive position of some small, marginal businesses in California if these businesses lack resources to develop commercially acceptable products in a timely

manner. As stated above, such impacts can be mitigated to a degree with a justifiable compliance extension under the variance provision of the Consumer Products Regulation, or through additional regulatory flexibility afforded by the IPP or the ACP Regulation (see Subsection H).

C. ANALYSIS OF POTENTIAL IMPACTS TO CALIFORNIA STATE OR LOCAL AGENCIES

We have identified one State agency that could be affected by the proposed new limits. The California Prison Industry Authority (PIA) manufactures and markets consumer products for use in State service. This is the only agency we are aware of that makes consumer products. The PIA manufactures a liquid disinfectant concentrate, which will be subject to the proposed one percent limit for non-aerosol disinfectants. This product meets the proposed new limit for non-aerosol disinfectants. The PIA also sells bar soaps, powder bleaches, liquid glass cleaners, liquid multipurpose cleaner and degreasers, and liquid and powder detergents (PIA, 2006). The proposed measures do not affect these categories and, as such, will not have an impact on the PIA. Based on the above, we have determined that the proposed limits will not create costs or savings, as defined in Government Code section 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, or other nondiscretionary savings to local agencies.

D. ANALYSIS OF THE COST-EFFECTIVENESS (C.E.) OF THE PROPOSED LIMITS

Introduction

In the following analysis, we evaluate the anticipated cost-effectiveness of the proposed new limits. Such an evaluation allows us to compare the efficiency of the proposed limits in reducing a pound of VOC relative to other existing regulatory programs. To do this, we applied a well-established methodology for converting compliance costs, both nonrecurring and recurring, to an annual basis. We then report the ratio of the annualized costs to the annual emission reductions in terms of "dollars (to be) spent per pound of VOC reduced." For perspective, we compare the estimated cost-effectiveness of the proposed limits to the cost-effectiveness of other ARB regulations and control measures.

Methodology

The cost-effectiveness (C.E.) of a reduction strategy is generally defined as the ratio of total dollars to be spent to comply with the strategy (as an annual cost) to the mass reduction of the pollutant(s) to be achieved by complying with that strategy (in annual pounds). Annual costs include annualized nonrecurring fixed costs (e.g., total research and development (R&D), product and consumer testing, equipment purchases/modifications, etc.) and annual recurring costs (e.g., raw materials, labeling, packaging, etc.).

We annualized nonrecurring fixed costs using the Capital Recovery Method, as recommended under guidelines issued by the California Environmental Protection Agency (Cal/EPA). Using this method, we multiply the estimated total fixed costs to comply with the limits by the Capital Recovery Factor (CRF) to convert these costs into equal annual payments over a project horizon (i.e., the projected useful life of the investment) at a discount rate (Cal/EPA, 1996). We then sum the annualized fixed costs with the annual recurring costs and divide that sum by the annual emission reductions to calculate the cost-effectiveness of the regulation, as shown by the following general equation:

Cost-Effectiveness (1)

$$= \frac{\text{(Annualized Fixed Costs)} + \text{(Annual Recurring Cost)}}{\text{(Annual Mass Reduction in VOC)}}$$

where:

$$\text{Annualized Fixed Costs} = \text{(Fixed Costs)} \times \frac{i(1+i)^n}{(1+i)^n - 1} \qquad (2)$$

$i(1+i)^n/((1+i)^n-1)$	=	Capital Recovery Factor (CRF)
i	=	discount interest rate over project horizon, %
n	=	number of years in project horizon
Fixed Costs	=	total nonrecurring cost per product category
	=	(Nonrecurring Cost per Product) x (Total Noncompliant Products in the Category)

As shown by the raw materials cost analyses in Appendix F, a convenient method for estimating the annual recurring cost portion of overall cost-effectiveness is to separate Equation (1) into two fractions, one for the nonrecurring costs and one for the recurring costs. It can then be shown that the C.E. fraction for recurring costs can be simplified and calculated as follows:

$$\text{Annual Recurring Costs C.E.} = \frac{\textit{(Compliant Materials Cost) - (Baseline Materials Cost)}}{\textit{(Baseline VOC Content) - (Compliant VOC Content)}} \quad (3)$$

where,

Baseline Materials Cost	=	cost of raw materials for product before reformulation to the proposed limit $/lb product
Baseline VOC Content	=	product VOC weight fraction before reformulation to limit, lb VOC/lb product
Compliant Materials Cost	=	cost of raw materials for compliant product, $/lb product
Compliant VOC Content	=	product VOC weight fraction of compliant product, lb VOC/lb product.

To use Equation (3), we determined typical VOC contents of both compliant and noncompliant products in each of the 18 product categories/subcategories, based on sales data and the speciated formulations as reported by manufacturers in the ARB's 2003 Consumer and Commercial Products Survey. To the extent feasible, we then determined the detailed formulations that most closely reflect the "typical" compliant and noncompliant VOC contents. These formulations, in turn, were designated as compliant and baseline formulations, respectively.

For most ingredients, we used the most recent, distributor-level bulk prices from the *Chemical Market Reporter* web site (CMR 2006). Costs for other ingredients were obtained from discussions with chemical suppliers, or from web searches of analytical grade chemicals. All of these data sources were used to calculate the baseline and compliant material costs based on these designated formulations. Inorganic compounds were assigned a low and high cost of $0.09 and $0.91 per pound based on the costs found of the most common inorganic compounds found in the product categories. Other unspecified ingredients or ingredients for which prices were unknown were grouped into an "all others" classification and assigned a default low and high cost of $3.50 and $7.00 per pound, respectively (ARB, 1997, *op cit.* at Volume II, p.56). These analyses are shown in Appendix F and discussed in more detail in "Analysis of Impacts to Raw Materials Cost" later in this section.

Assumptions

We calculated the cost-effectiveness with an assumed project horizon of 10 years, a commonly cited period for an investment's useful lifetime in the chemical processing industry. We also assumed a fixed interest rate of 10 percent throughout the project horizon. These assumptions are conservative and constitute standard practice in cost-effectiveness analyses of air pollution regulations, including previous consumer product rulemakings. Based on these assumptions, the Cost Recovery Factor (CRF) is 0.16275.

In the first Mid-Term Measures rulemaking, we assumed products reformulated to meet the proposed limits will be marketed throughout the U.S. by national marketers (ARB, 1997, VII-Ch-VII, p.13). We found that businesses generally formulate for and distribute to the entire nation products compliant with our regulations rather than incurring the additional cost of setting up a California versus 49-state product distribution system. We believe the same strategy will be employed by companies subject to the proposed new limits; we therefore assumed in the Midterm II analysis that, for the annualized fixed cost portion of Equation (1), it was appropriate to use the fixed cost for national production divided by the national emission reductions.

However, an alternative but equivalent approach which we used in this analysis, is to report the California-apportioned (by population) annualized fixed cost divided by the California-apportioned emission reductions. To illustrate, a manufacturer may need to install $10 million worth of equipment to produce its national sales volume of products compliant with the proposed limits. However, if the company were to produce a California and 49-state product, the company may only need to install $1 million worth of equipment to produce unit sales sufficient for the smaller California market. Using this alternative approach, we discounted the total fixed costs for producing national sales volumes by the California-apportionment factor (i.e., the current ratio of California to U.S. population, or 12.2 percent), which we then divided by the California-only emission reductions. It is important to note that, while both of the approaches described above -- the national marketing and California-only approaches -- reach the same conclusion, they do so for different reasons as discussed above.

For the annual recurring costs, we assumed compliant reformulations would result in cost changes as a result of changes in a product's raw materials and their associated prices. Changes in packaging, labeling, distribution and other recurring costs were assumed to be negligible relative to baseline levels of these costs. This assumption is based on our previous regulatory experiences. To illustrate, in 1996, we conducted a comprehensive technical assessment of the 55 percent VOC hairspray limit, which required extensive reformulations and revolutionary changes to existing products (ARB, 1997a). The hairspray limit is generally considered to be among the most challenging of the consumer product limits; it likely resulted in more changes to the regulated product, relative to pre-regulatory products, than any other VOC limit. However, our assessment found that changes to recurring costs other than hairspray raw material costs were expected to be negligible (*Id*, Vol-II, p.54). Based on this finding and because the proposed new limits are designed to preserve product forms, we believe our assumptions regarding the recurring costs are reasonable.

Results

A review of relevant technical literature and industry trade journals provided little information that we could use to estimate costs directly. This is not surprising, because the consumer products industry is very competitive, and production cost data specific to a company are closely-guarded trade secrets. We have received significant comments regarding our assumptions for fixed costs from specific interested parties. We worked

with these industry representatives to obtain new, updated, substantiated fixed cost data. The information we received generally confirms our cost assumptions to be correct. We therefore developed estimates for the nonrecurring costs based on analogous costs reported by ARB staff for the Phase II consumer products rulemaking (*Id*, Appendix D1). The Phase II nonrecurring costs are applicable for this analysis since they were based on staff's detailed estimates of labor, research and development, equipment purchase, and other costs involved in product reformulations for generic household, automotive, and personal care categories, all of which are impacted by proposed limits. This is the same approach we used for the 1997 Mid-Term Measures rulemaking, the 1999 Mid-Term Measures II rulemaking and the 2004 rulemaking.

The Phase II nonrecurring investment costs, reported in 1991 dollars, were adjusted to 2005 dollars using a well-established method of ratioing chemical engineering plant cost indices as follows (Peters and Timmerhaus, 1980):

$$Non-Recurring\,Costs\,(in\ 2005\ dollars) = \frac{Non-Recurring\ Costs\,(in\ 1991\,dollars)}{10} \times \frac{C.E.\ 2005\ Index}{C.E.\ 1991\,Index} \quad (4)$$

where,

C.E. 2005 index = 2006 Chemical Engineering Plant Cost Index = 480.7 (*Chemical Engineering*, February 2006).

C.E. 1991 index = 1997 Chemical Engineering Plant Cost Index = 361.3 (*Chemical Engineering*, April 1997).

We believe the original Phase II cost estimates were beneficial at the time of the rulemaking for predicting the costs to comply with those limits. However, it was discovered during Midterm II that these original cost estimates grossly overestimated the true nonrecurring costs for Phase II by a factor of ten (ARB, 1999, op cit. at Vol II, Chapter VII, Page 211). We therefore estimated the nonrecurring costs for the proposed new limits by adjusting the Phase II estimates to be consistent as shown in Equation (4).

Table VII-5 shows our estimates for per-product and total annualized nonrecurring costs for each of the 18 product categories/subcategories subject to the proposed limits. As shown, we project a per-product annualized nonrecurring cost ranging from a low of about $2,000 to a high of about $124,000. With over 1,000 noncompliant products that would need to be reformulated, the overall total annualized fixed cost to industry is projected to range from about $1.6 million to just over $12.6 million dollars per year, with a general breakdown of this range as follows: automotive care products (40 percent), household care products (51 percent), personal care products (8 percent) and adhesives (1 percent).

Our analysis shows that the cost-effectiveness of the proposed requirements is similar to the cost-effectiveness of other existing ARB regulatory programs. We estimate the total overall cost effectiveness of the initial proposed limits and other requirements to be about $2.35 per pound of VOC reduced.

It should be noted that a contributing factor to the total average cost per pound of VOC reduced is that the VOC emission reductions achieved from some of the proposed limits specific to individual categories may be quite low. A limit may have been set largely as a cap, with the few reductions being achieved resulting in a few VOC reductions and a low cost effectiveness. While the costs incurred by manufacturers to reformulate small categories is not excessive, when those costs are apportioned to a relatively small emission reduction, the cost effectiveness may appear low. Therefore, when presenting the cost effectiveness of the proposal, one should consider the effect of relatively low cost effectiveness (high cost per pound of VOC reduced) in some categories.

Table VII-5
Estimated Total Nonrecurring Fixed Costs to Comply with Proposed Limits

Table VII-5. Estimated Total Annualized Non-Recurring Fixed Cost to Comply with Proposed Standards

Category	Proposed Limit	Market Covered (% covered by 2003 Survey)	Market Adj. Factor	Estimated # Products Non-compliant* (A)	Estimated Total One-Time Cost to Reformulate Per Product (dollars) Low (B0)	High (B1)	Estimated Annualized Cost to Reformulate Product (dollars per year) Low (B2 =B0 x CRF)	High (B3 =B1 x CRF)	Estimated Annualized Fixed Cost to Reformulate All Non-Compliant Products (dollars per year) Low(AxB2)	High (AxB3)
Adhesives										
Construction, Panel, and Floor Covering Adhesive	7	90	1.11	38	$1,929	$16,032	$314	$2,609	$11,861	$98,569
			Sum	38					$11,861	$98,569
Automotive										
Brake Cleaner										
Aerosol	10	90	1.11	77	$8,648	$114,155	$1,407	$18,578	$107,903	$1,424,324
Non-Aerosol	10	90	1.11	24	$8,648	$114,155	$1,407	$18,578	$34,404	$454,132
Automotive Windshield Washer (Type A)	25	90	1.11	29	$8,648	$8,648	$1,407	$1,407	$40,659	$40,659
Carburator or Fuel-Injection Intake Cleaners										
Aerosol	10	90	1.11	100	$8,648	$114,155	$1,407	$18,578	$140,743	$1,857,814
Non-Aerosol	10	90	1.11	20	$8,648	$114,155	$1,407	$18,578	$28,149	$371,563
Engine Degreaser (aerosol)	10	90	1.11	48	$8,648	$114,155	$1,407	$18,578	$67,244	$887,622
			Sum	298					$419,103	$5,036,114
Household Care										
Bathroom & Tile Cleaner (non-aerosol)	1	90	1.11	81	$13,571	$13,571	$2,209	$2,209	$179,141	$179,141
Disinfectant										
Aerosol	70	90	1.11	43	$4,124	$24,481	$671	$3,984	$29,087	$172,645
Non-aerosol	1	90	1.11	82	$2,927	$18,494	$476	$3,010	$39,168	$247,468
Floor Polish or Wax (flexible)	1	90	1.11	212	$8,648	$68,253	$1,407	$11,108	$298,689	$2,357,345
Floor Polish or Wax (nonresilient)	1	90	1.11	61	$8,648	$68,253	$1,407	$11,108	$86,010	$678,817
Furniture Maintenance Product (non-aerosol)	3	90	1.11	33	$10,378	$42,176	$1,689	$6,864	$56,297	$228,798
General Purpose Cleaner (aerosol)	8	90	1.11	91	$5,854	$30,335	$953	$4,937	$86,804	$449,802
General Purpose Degreaser (aerosol)	10	90	1.11	91	$13,571	$124,266	$2,209	$20,224	$201,227	$1,842,609
Laundry starch product/ sizing/ fabric finish (aerosol)	4.5	90	1.11	13	$13,571	$13,571	$2,209	$2,209	$29,448	$29,448
Oven or Grill Cleaner (non-aerosol)	1	90	1.11	62	$2,794	$18,094	$455	$2,945	$28,293	$183,231
Sanitizer										
Aerosol	70	90	1.11	7	$3,526	$21,487	$574	$3,497	$3,825	$23,313
Non-Aerosol	1	90	1.11	18	$2,927	$18,494	$476	$3,010	$8,469	$53,507
			Sum	796					$1,046,458	$6,446,123
Personal Care										
Temporary Hair Color (aerosol)	55	75	1.33	107	$8,382	$59,073	$1,364	$9,614	$145,507	$1,025,479
			Sum	107					$145,507	$1,025,479

2006 Chemical Engineering Plant Cost Index =	480.7	(Final 2/06)	Discount Rate	10.00%	Grand Annual Total $1,622,928 $12,606,284
1991 Chemical Engineering Plant Cost Index =	361.3	(Final 1991)	Project Horizon, yrs	10	(dollars per year)
			Cost Recovery Factor	0.16275	

* # Noncompliant Products = Market Adj. x (# Noncompliant Products in Survey)

** 100% of the market complies with standard

Table VII-6 shows a comparison of the cost-effectiveness for the proposed limits relative to other ARB consumer product regulations and control measures. As shown, the cost-effectiveness range of the staff's proposal is consistent with the cost-effectiveness of other ARB regulations and programs. As expected, costs for the proposed 2006 Amendments are in some cases higher than other recent consumer products measures. These higher costs can be attributed to regulating smaller emitting and/or more challenging categories than in the past.

Table VII-6
Comparison of Cost-Effectiveness for ARB Consumer Product Regulations/Measures

Regulation/Control Measure	Cost-Effectiveness (Dollars per Pound VOC Reduced)
2006 Amendments (current proposal)	$2.35
2004 Amendments[1]	$2.01 to $2.34
Mid-Term Measures II Consumer Products[2]	$0.40
Mid-Term Measures Consumer Products[3]	$0.25
Hairsprays[4]	$2.10 to $2.50
Aerosol Coating Products[5]	$2.85 to $3.20
Phase II Consumer Products Regulation[6]	<$0.01 to $1.10
Phase I Consumer Products Regulation[7]	net savings to $1.80
Antiperspirants and Deodorants[8]	$0.54 to $1.30
Architectural and Industrial Maintenance Coatings[9]	net savings to $6.90

1 Categories where reduction of toxic air contaminant emissions occurred were included.
2 ARB, 1999.
3 Range reported as min./max. for each individual Phase III limit; average C.E. of $0.25/lb reduced reported as an emission reductions-weighted average cost-effectiveness; ARB, 1997.
4 Reported as sales-wtd average, incremental 2nd-tier cost-effectiveness (80% VOC to 55% VOC);
5 ARB, 1997.
6 ARB, 1995.
7 ARB, 1990.
8 ARB, 1991.
9 ARB, 1989a.
11 Suggested Control Measure, developed with the California Air Pollution Control Officers Association; ARB, 1989b.

E. ANALYSIS OF THE IMPACTS TO RAW MATERIALS COST

Introduction

In this analysis, we evaluated the anticipated cost impacts from the proposed limits on raw material costs. As stated previously, the raw material costs generally constitute the major portion of the compliance costs for most categories. However, evaluating the impacts to raw material costs provides only an indicator of possible impacts to the retail prices of the affected products (assuming the cost impacts are passed on partially or fully to consumers). Because of unpredictable factors such as the highly competitive nature of the consumer products market, it is not possible to accurately predict the final retail price of products that will comply with the proposed limits when they become effective. To the extent the cost impacts are passed on to consumers, the final retail prices may be lower or higher than suggested by this analysis.

Methodology

As discussed previously, we determined the detailed formulations which most closely reflect the "typical" compliant and noncompliant VOC contents. These formulations, in turn, were designated as compliant and baseline formulations, respectively. Distributor-level ingredient prices from *Chemical Market Reporter* magazine (CMR, 2006), and chemical materials distributors were used to calculate the baseline and compliant material costs for these formulations. Other sources of cost information were used for selected ingredients as discussed previously. Other than compounds specifically requested, the 2003 Consumer Products Survey did not ask for specific ingredient details for exempt, fragrance, some low vapor pressure VOCs, and inorganic compounds. Unspecified ingredients or ingredients for which prices were unknown were grouped into an "all others" classification and assigned a default low and high cost of $3.50 and $7.00 per pound, respectively (ARB, 1997, *op cit.* at Volume II, p.56). However, inorganic compounds tend to be less expensive and using the default low and high cost would not give an accurate representation of inorganic compound cost. Therefore inorganic compounds were assigned a low and high cost of $0.09 and $0.91 per pound based on the costs found of the most common inorganic compounds found in the product categories. These analyses and the detailed formulations evaluated (with individual weight fractions and unit prices per pound) are shown as cost spreadsheets in Appendix F. While these formulations may not reflect the exact composition of existing noncompliant products and compliant products that will be marketed, we believe they are reasonably representative for the purposes of this analysis.

Assumptions

As noted previously, we assumed changes in packaging, labeling, distribution and other recurring costs to be negligible relative to baseline levels of these costs (ARB, 1997). The most likely pathway for reformulation was assumed for noncompliant products. Despite this assumption, alternative formulations using non-VOC propellants, compressed gases, or dimethyl ether (DME), or some combination with these or existing technologies may allow lower-cost compliant products than shown in our analysis.

Results

As shown in Table VII-7, the anticipated raw materials cost changes range from no cost (net savings or no cost) to about $0.44 increase per unit (for aerosol Carburetor or Fuel-Injection Air Intake Cleaner).

Table VII-7. Estimated Impacts to Raw Materials Cost Per Unit

Category	Estimated Raw Material Costs, $/Unit of Product					
	Baseline Pre-Regulatory		Compliant		Cost Difference from Baseline Pre-Reg	
	Low (A0)	High (B0)	Low (A1)	High (B1)	to Low (A1)-(A0)	to High (B1)-(B0)
Adhesives						
Construction, Panel, and Floor Covering Adhesive	0.94	1.72	0.87	1.60	0.00	0.00
Automotive						
Brake Cleaner						
Aerosol	0.34	0.38	0.05	0.06	0.00	0.00
Non-aerosol	3.77	4.02	0.05	0.11	0.00	0.00
Automotive Windshield Washer Fluid (Type A)	2.46	2.73	0.59	0.66	0.00	0.00
Carburetor or Fuel-Injection Air Intake Cleaners						
Aerosol	0.47	0.49	0.91	0.93	0.44	0.44
Non-aerosol	0.28	0.30	0.57	0.59	0.29	0.29
Engine Degreaser (aerosol)	0.12	0.15	0.05	0.06	0.00	0.00
Household Care						
Bathroom & Tile Cleaner (non-aerosol)	0.09	0.29	0.03	0.09	0.00	0.00
Disinfectant						
Aerosol	0.47	0.51	0.37	0.41	0.00	0.00
Liquid	2.61	3.59	1.24	2.13	0.00	0.00
Floor Polish or Wax (flexible)	42.85	79.11	40.46	75.69	0.00	0.00
Floor Polish or Wax (nonresilient)	42.85	79.11	40.46	75.69	0.00	0.00
Furniture Maintenance Product (non-aerosol)	1.58	2.64	1.66	2.93	0.08	0.29
General Purpose Cleaner (aerosol)	0.07	0.08	0.07	0.09	0.00	0.01
General Purpose degreaser (aerosol)	0.86	0.92	1.03	1.13	0.17	0.21

Table VII-7
Estimated Impacts to Raw Materials Cost Per Unit (continued)

Table VII-7. Estimated Impacts to Raw Materials Cost Per Unit (continued)

Category	Estimated Raw Material Costs, $/Unit of Product					
	Baseline Pre-Regulatory		Compliant		Baseline Pre-Reg to Low	Baseline Pre-Reg to High
	Low (A0)	High (B0)	Low (A1)	High (B1)	(A1)-(A0)	(B1)-(B0)
Laundry starch product/ sizing/ fabric finish (aerosol)	0.19	0.34	0.18	0.34	0.00	0.00
Oven or Grill Cleaner (non-aerosol)	1.36	1.55	0.97	1.14	0.00	0.00
Sanitizer						
Aerosol	0.42	0.44	0.22	0.24	0.00	0.00
Non-aerosol	1.28	2.18	0.03	0.04	0.00	0.00
Personal Care						
Temporary Hair Color (aerosol)	0.18	0.22	0.14	0.20	0.00	0.00
					Min Increase	0.00
					Max Increase	0.44

Table VII-8 shows a comparison of the impacts to raw materials cost under the proposed limits relative to those of other ARB consumer product regulations.

Table VII-8
Comparison of Raw Materials Cost Impacts for the Proposed Limits and Other ARB Consumer Product Regulations (unadjusted dollars)

Regulation	Cost Impacts (Dollars per Unit of Product)
2006 Amendments (current proposal)	$0.00 to $0.44
2004 Amendments[1]	$0.00 to $0.77
Mid-Term Measures II[2]	$0.00 to $0.25
Phase III (Mid-Term Measures 1) Consumer Products Regulation[3]	$0.00 to $0.60
Hairsprays[4]	($0.10) to $0.45
Aerosol Coating Products[5]	$0.30 to $0.34
Phase II Consumer Products Regulation[6]	<$0.01 to $0.60
Phase I Consumer Products Regulation[7]	net savings to $0.25
Antiperspirants and Deodorants[8]	$0.25

1 A worst case raw material cost per unit of $1.34 was estimated for products packaged in gallon containers.
2 ARB, 1999.
3 Phase III Staff Report; ARB, 1997
4 $0.45/unit reported as a worst-case scenario using high-level of HFC-152a as propellant in "premium" products. ARB, 1997.
5 ARB, 1995.
6 ARB, 1991.
7 ARB, 1990.
8 Estimate based on assumption of using HFC-152a to replace HC propellants and meet the 0 percent HVOC limit.

F. ANALYSIS OF THE COMBINED IMPACTS ON PER-UNIT COST FROM RECURRING AND NONRECURRING COSTS

Introduction

In this analysis, we evaluated the combined impacts of both recurring (i.e., raw materials costs) and nonrecurring costs from the proposed limits on per-unit costs. Although the raw material costs generally constitute the major portion of the compliance costs, in some categories, the nonrecurring (fixed) cost was the major contributor. In performing this analysis, we used the fixed costs, raw material costs, assumptions, and other facts discussed previously.

Methodology

Discussion of Nonrecurring costs

Historically, staff has considered a variety of costs in its calculations to determine the costs of complying with proposed VOC limits affecting consumer products. In the 1991 Phase II Consumer Products Rulemaking, staff developed a methodology to determine nonrecurring reformulation costs (non raw material costs) for proposed VOC limits. These costs were broken down by each process needed for reformulation to occur (ARB, 1991). It was subsequently determined through a thorough cost analysis of the reformulations that was done to comply with the 55 percent VOC limit for hairspray, that these costs were overestimated by a factor of 10. It was widely believed that the 55 percent VOC limit for hairspray represented the most aggressive, challenging, and expensive reformulation that had been required by the Consumer Products Regulations. Therefore, subsequent cost analyses grew the factors by the (Chemical Engineering Plant Cost Index) then divided these reformulation factors by 10 (see equation (4)).

There are many variables in producing a product for market, and assumptions about those variables will greatly affect the outcome of any cost analysis. For each assumption, a test of "reasonableness" was applied to determine if this was a likely approach to take or if the event had a high probability of occurring. Results were also compared to data provided by other agencies and industry to verify that the numbers are "reasonable." Significant input regarding reformulation costs have been provided by industry representatives. In all cases, only new or additional costs were considered. Costs were not considered that would have been expected in the normal course of business if the regulation had not been in effect.

To estimate nonrecurring cost numbers, the staff considered two cost estimate approaches for each product category, one for low cost, and one for high cost, with a different set of assumptions for each approach. To further refine the analyses, the product categories proposed for regulation were grouped under "automotive care," "personal care," "adhesives/sealants & caulks," "cleaners & degreasers/disinfectant," "fabric care," and "waxes & polishes" to better reflect the impact on each category.

Approach

For a systematic approach to the cost analysis, the entire time from initial statement of development goals to final delivery of the new product to the marketplace shelves was divided into eight phases. The phases are: product development, including reformulation and development of a new delivery system if necessary; stability testing; efficacy testing; safety testing; labeling modification; registration with regulatory agencies, if necessary; manufacturing change; and marketing. The length of time in each phase was estimated based on an industry analysis of 80 new product innovations. Most of the phases occur in sequence; however, there is some time overlap in each phase.

Next, estimated personnel resources were allocated against each phase considering the most probable types of skills needed including general engineering; technician; drafting; packaging engineering; specification engineering; model making; chemical engineering; technical publication; production support; quality assurance; marketing; warehousing; word processing; and clerical. For high cost elements, additional personnel were allocated to each phase.

After the personnel costs were determined, additional cost elements were considered at each phase and added as appropriate. These costs elements are facility cost; equipment cost; tool; jig; fixture and miscellaneous materials handling equipment; purchased material; packaging costs; distribution costs; warehousing; technical data; research studies and tests; promotional literature; residual inventory and disposal; consumer tests; general and administrative expense; patent cost; registration fees; and computer support. The result of these considerations is a per-product cost for developing a reformulated product and putting it on the market.

Assumptions

The staff used different assumptions for the low and high cost analyses, and considered the specific likelihood that each of the cost elements would occur for each product category individually. In reviewing the ARB 2003 Consumer Products Survey, the staff found that many of the products which would technically be noncomplying are within a couple of percentage points of VOC weight from being in compliance with the standard. These products may require only minor modification to their current formulation to come into compliance. Therefore, for the low cost analysis no major costs were added for changing delivery systems or other product attributes.

In addition, it is common that large companies having significant market share and broad product lines offer both low VOC complying products and higher VOC noncomplying products. In many cases, relatively low costs would be incurred where these companies could simply increase sales and distribution of complying products and discontinue noncomplying products.

Since the products did not change significantly, they would not require any major retooling of manufacturing equipment, technical data changes would be minor, and it was assumed that the change in marketing costs would be small. It was also assumed that these reformulated products would be marketed nationally.

For the high cost approach, each category was analyzed individually to determine which of the elements, discussed above, manufacturers would likely include in their reformulation efforts. High costs for specific steps of the reformulation process were only included in the cost analysis where staff believed they were likely to occur. If staff believed a markedly different product would be needed to comply with the proposed limit, such as a new delivery system, then high personnel and capital resources especially in product development and manufacturing change were assumed. In addition, a new delivery system would require investment for prototypes, new filling

machines training, and technical data, so these high costs were also included in these scenarios. Additional costs were also added for packaging, distribution and warehousing. In areas where it was anticipated that little or no reformulation would occur, or that the cost of reformulation would be minimal, the value for low cost was used (Automotive Windshield Washer (type A), Laundry starch product/sizing/fabric finish).

For especially challenging limits, it was assumed for the high cost approach that, because of a markedly different product, there would also be additional marketing costs, including research studies and tests, promotional literature, and consumer tests. These costs vary by the type of product, with household products typically having a larger expense in this area. The cost analysis did not include the costs for an extensive advertising campaign. New products are regularly brought onto the market, and the advertising for a new product, whether reformulated or not, would replace the advertising for the existing product, and would be a normal cost. It was assumed that the new product would be marketed nationally.

The staff also recognized that development of a new product does not occur in isolation. Few companies have only one product line; for those that have more than one product line, the product lines can be very similar. Development and production tasks, from the initial concept through marketing, would be proceeding simultaneously on more than one product line, with a transfer of information and work-sharing between the products. For these companies, this "technology transfer" would substantially reduce the cost of developing and marketing a new product on a per product basis. For categories where the majority of products were held by a few companies it was assumed that this "technology transfer" would occur, and high costs adjusted accordingly.

Therefore, staff has considered only nonrecurring costs that are likely to occur on a per category basis. If it was determined that for a majority of products in the category, the most likely scenario was that only minor changes to the product's reformulation were necessary to comply with the new proposed limit then only the lower end of the nonrecurring cost was included. For some categories, it was appropriate, based on the variety of products and reformulation approaches needed to meet the proposed limit, that certain high cost factors be included in the analysis but not others on a case by case basis. We believe that this approach gives a more realistic estimate of the costs of a given limit.

Results

As shown in Table VII-9, the combined fixed and raw material cost changes to per-unit production costs ranged from no cost increase (net savings or no cost for various categories) to about $2.27 per unit (for 5 gallons of Floor Polish or Wax). Averaged over all of the noncomplying products affected by the proposed limits and other requirements, the product weighted average cost increase is about $0.06 per unit.

Table VII-9
Estimated Per-Unit Cost Increases from Both Annualized Nonrecurring and Annual Recurring Costs

Table VII-9. Estimated Per-Unit Cost Increases from Both Annualized Non-Recurring and Annual Recurring Costs

Category	Sales-Wtd Average VOC Content, %	Estimated VOC Emissions, tons/day	Typical Unit Weight Ounces	Complying Market Share	Estimated Non-complying Unit Sales Per Day in Calif.	Estimated Per Unit Production Cost Increase						
						Annualized Nonrecurring Low Cost/Unit	Annualized Nonrecurring High Cost/Unit	Annual Recurring Low Cost/Unit	Annual Recurring High Cost/Unit	Total Increase Low/Unit	Total Increase High/Unit	Total Increase Mid/Unit
	(A)	(B)	(C)		(D)	(E1)	(E2)	(F1)	(F2)	G1=(E1+F1)	G2=(E2 + F2)	(G1+G2)/2
Adhesives												
Construction, Panel, and Floor Covering Adhes	9.88	1.27	13	46.9	16,801	$0.00	$0.00	0.00	0.00	$0.00	$0.00	$0.00
Automotive												
Brake Cleaner												
Aerosol	43.23	4.81	14.00	4.50	24,288	$0.00	$0.02	0.00	0.00	$0.00	$0.02	$0.01
Non-Aerosol	37.67	0.145	106.00	22.40	90	$0.13	$1.68	0.00	0.00	$0.13	$1.68	$0.91
Automotive Windshield Washer Fluid (Type A)	33.1	1.7	126.90	17.00	1,075	$0.01	$0.01	0.00	0.00	$0.01	$0.01	$0.01
Carburetor or Fuel-Injection Air Intake Cleaners												
Aerosol	45.48	2.45	16.00	0.00	10,774	$0.00	$0.06	0.44	0.44	$0.44	$0.50	$0.47
Non-aerosol	59	0.450	9.90	26.40	1,821	$0.01	$0.07	0.29	0.29	$0.30	$0.36	$0.33
Engine Degreaser (aerosol)	23.47	1.05	14.00	9.00	9,305	$0.00	$0.03	0.00	0.00	$0.00	$0.03	$0.02
Household Care												
Bathroom & Tile Cleaner (non-aerosol)	0.7	0.3	24.00	83.30	9,543	$0.01	$0.01	0.00	0.00	$0.01	$0.01	$0.01
Disinfectant												
Aerosol	76.31	6.8	18.00	6.40	14,828	$0.00	$0.00	0.00	0.00	$0.00	$0.00	$0.00
Liquid	0.54	1.68	133.20	92.60	5,531	$0.00	$0.01	0.00	0.00	$0.00	$0.01	$0.01
Floor Polish or Wax (flexible)	1.08	0.76	688	82	589	$0.17	$1.34	0.00	0.00	$0.17	$1.34	$0.75
Floor Polish or Wax (nonresilient)	1.34	0.16	688	82	100	$0.29	$2.27	0.00	0.00	$0.29	$2.27	$1.28
Furniture Maintenance Product (non-aerosol)	5.09	0.7	120	30	2,567	$0.01	$0.03	0.08	0.29	$0.09	$0.32	$0.20
General Purpose Cleaner (aerosol)	12.17	0.344	18	12	4,422	$0.01	$0.03	0.00	0.01	$0.01	$0.04	$0.03
General Purpose Degreaser (aerosol)	46.24	0.98	19.00	3.10	3,459	$0.02	$0.18	0.17	0.21	$0.19	$0.39	$0.29
Laundry starch product/ sizing/ fabric finish (aerosol)	4.78	1.11	22	0.6	33,574	$0.00	$0.00	0.00	0.00	$0.00	$0.00	$0.00
Oven or Grill Cleaner (non-aerosol)	2.53	0.3	144.00	25.50	1,963	$0.00	$0.03	0.00	0.00	$0.00	$0.03	$0.02
Sanitizer												
Aerosol	93.3	1.41	10.00	0.00	4,836	$0.00	$0.00	0.00	0.00	$0.00	$0.00	$0.00
Liquid	1.62	0.47	133.2	92.5	523	$0.01	$0.03	0.00	0.00	$0.01	$0.03	$0.02
Personal Care												
Temporary Hair Color (aerosol)	94.7	0.31	3.00	0.10	3,488	$0.01	$0.10	0.00	0.00	$0.01	$0.10	$0.06

Notes:
(1) (E) = Total Annualized Non-recurring Cost / [(D) * 365]
(2) Figures in "( )" are negative (i.e., indicates potential cost savings)

G. OTHER POSSIBLE ECONOMIC IMPACTS

Impacts of Proposed Regulatory Changes

Beyond the VOC limits, there are other proposed changes to the Consumer Products Regulation, some of which may have a potential to economically impact affected businesses. While we do not expect any significant economic impact from any of the proposals, it is possible that there could be some increased cost to business resulting from proposed changes to the product category definitions in the categories of Multi-purpose Solvent, Electronic Cleaner, Rubber/Vinyl Protectant, and Fabric Protectant if companies choose to relabel.

We have already calculated economic impacts on businesses in terms of cost to reformulate products to meet VOC limits. As part of that analysis, it is assumed that there are various plant process changes and other costs, including relabeling of products. Those costs were already reflected in the economic analysis where reformulating is required. We believe there may be some products that do not need to reformulate, because they already comply with the VOC limits, but they may need to relabel because of other proposed changes to the regulation.

H. MITIGATION OF POTENTIAL IMPACTS THROUGH ADDITIONAL REGULATORY FLEXIBILITY

If adopted by the Board, the proposed limits will be incorporated in section 94509 of the Consumer Products Regulation (title 17, California Code of Regulations, sections 94507-94517). To complement the mandatory VOC limits specified in section 94509, the existing consumer products program provides a very high degree of compliance flexibility to mitigate cost impacts as much as possible, through two voluntary, market-based programs: the IPP and the ACP Regulation. The IPP established in section 94511 (title 17, CCR), allows qualified manufacturers to sell products that have VOC contents greater than the applicable VOC limit, provided they demonstrate that such products actually emit less VOCs than representative products that comply with the VOC limit. Using the emissions trading approach, the ACP is a voluntary regulation (title 17, CCR, sections 94540-94555) designed to allow multi-product VOC averaging as an alternate means of complying with the VOC limits.

Various manufacturers have formulated technologically-advanced IPP products that are more concentrated, higher in efficacy, or have some other chemical or physical properties that permit users to release less VOCs when using such products. To date, 14 manufacturers have submitted and obtained approval for 25 IPP applications involving 23 products. Based on their participation in the program, it is reasonable to conclude that manufacturers are using this program to provide consumers with products that meet their needs, while lowering costs, improving the "market value" of their products, or otherwise maintaining profit margins.

The potential benefits of emissions averaging or "bubbling" for consumer product manufacturers under the ACP regulation have been documented by ARB staff (ARB, 1994). In general, emissions averaging under approved ACP plans allows manufacturers to choose the least-cost or other advantageous reformulation options for its product lines. Rather than directly complying with each and every VOC limit, manufacturers can choose to "overcomply" with some reformulations in order to offset the "undercompliance" of other product lines. The ACP regulation requires the net resulting emissions from products under such averaging plans to be no greater than the level which would have resulted had all the products under the ACP bubble directly complied with the applicable limits. In short, the same emission reductions are achieved while providing a high degree of formulation and marketing flexibility to manufacturers. To date, three manufacturers have implemented approved ACP averaging programs, reducing VOC emissions by about 4.9 million pounds more than would have occurred under the mandatory VOC limits. We anticipate that such emissions averaging will also benefit manufacturers subject to the proposed limits.

Overall, most affected businesses will benefit from the IPP and the ACP Regulation. Both programs are completely voluntary and impose no additional costs to businesses to meet their requirements other than testing and reporting requirements. Manufacturers who take advantage of these market-based programs presumably do so because it costs less than direct compliance with the limits or it provides some other market benefits.

According to previous staff analyses, the potential cost differential which might result from competition under the ACP between small and large firms would not necessarily cause extreme hardship on small firms (*Id.* at Vol.II, X-13). However, inclusion of the proposed limits in the ACP regulation may increase the level of competition for some products and may lead to the elimination of some marginal producers for those products. Such competition may also have minor impacts on California employment and payroll. However, the impact is expected to be positive in the long term. Any potential impacts on the ability of California businesses to compete with businesses in other states are also expected to be minimal.

REFERENCES

1. Air Resources Board, Technical Support Document. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Antiperspirants and Deodorants. September 1989a, Appendix C, pp. C.1-C.62. (ARB, 1989a)

2. Air Resources Board and the California Air Pollution Control Officers Association. Suggested Control Measure for Architectural and Industrial Maintenance (AIM) Coatings. Staff Report, 1989b. (ARB, 1989b)

3. Air Resources Board, Technical Support Document. Proposed Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products. August 1990, pp. 67-71 and Appendix E. (ARB, 1990)

4. Air Resources Board, Technical Support Document. Proposed Amendments to the Statewide Regulation to Reduce Volatile Organic Compound Emissions from Consumer Products - Phase II. October 1991, pp. VI.1-VI.6 and Appendix D. (ARB, 1991)

5. Air Resources Board, Staff Report. Proposed Alternative Control Plan for Consumer Products. August 1994, pp. III.3-III.5 and VI.8-VI.24. (ARB, 1994)

6. Air Resources Board. Initial Statement of Reasons for a Proposed Statewide Regulation to Reduce Volatile Organic Compound Emissions from Aerosol Coating Products and Amendments to the Alternative Control Plan for Consumer Products. February 3, 1995, Volume II, pp. VIII.1-VIII.20, X.1-X.13 and Appendix G. (ARB, 1995)

7. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation. June 6, 1997, Volume II, Chapter VIII, pp. 1-27, *("Mid-term Measures I")*. (ARB, 1997)

8. Air Resources Board. Initial Statement of Reasons for Proposed Amendments Pertaining to Hairspray in the California Consumer Products Regulation. February 7, 1997, Volume II, pp. 44-59. (ARB, 1997a)

9. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation. September 10, 1999, Volume II, pp. 196-221, *("Mid-term Measures II")*. (ARB, 1999)

10. Air Resources Board. Initial Statement of Reasons for Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for Para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products. May 7, 2004, (ARB, 2004)

11. California Prison Industry Authority, On-Line Catalog. http://catalog.pia.ca.gov/onlinecat/catalog.php (PIA, 2006)

12. Chemical Market Reporter. Chemical Prices A-Z. http://chemicalmarketreporter.com Archive August 28, 2006. (CMR, 2006)

13. Chemical Engineering, April 1997; January 2002; June 2006.

VIII.

ENVIRONMENTAL IMPACTS

A. SUMMARY OF ENVIRONMENTAL IMPACTS

In this rulemaking, staff is proposing to amend the Consumer Products Regulation (Regulation) by establishing VOC limits for 15 categories of consumer products. The intent of these proposed amendments is to protect public health by reducing exposure to ground level ozone. Other amendments, designed to clarify various aspects of the Regulation, are also proposed. One minor amendment to the Aerosol Coatings Regulation to clarify product applicability is proposed as well.

We are also proposing to prohibit the use of Toxic Air Contaminants (TACs) in Bathroom and Tile Cleaner; Construction, Panel, and Floor Covering Adhesive; General Purpose Cleaner; and Oven Cleaner.

As part of this rulemaking, ARB staff has investigated the potential environmental impacts of the proposed amendments to the Consumer Products Regulation, and the Aerosol Coatings Regulation. Overall, staff has determined that the proposed amendments would have a positive environmental impact by reducing the amount of ground level ozone formed from consumer product VOC emissions. A VOC emission reduction of about 10.6 tons per day (tpd) is expected beginning December 31, 2008. In 2010, this reduction would grow to 11.5 tpd. Reductions in PM (secondary organic aerosols) are also expected.

Another environmental benefit of the proposal is prohibition of potential emissions of the TACs perchloroethylene (Perc), methylene chloride (MeCl), and trichloroethylene (TCE) from the four categories mentioned above. As explained in further detail below, many alternative products already exist.

ARB staff has also determined that no significant adverse environmental impacts should occur as a result of the proposed amendments relating to establishing VOC limits. Staff does estimate that there may be a slight increase, though not significant, in emissions of global warming compounds. We will monitor this potential impact through future surveys.

Minor changes are proposed to the Aerosol Coatings Regulation. These changes would have no adverse environmental impact because only technical changes are proposed that will not affect the environment. Chapter V of this report contains a complete description of these proposals.

Staff has conducted a qualitative health risk assessment that concludes that because VOCs are ozone precursors, public health is further protected by reducing VOC emissions. Staff has also determined that potential excess cancer cases may be

avoided and a person's direct exposure will be reduced by prohibiting the use of the chlorinated TACs Perc, MeCl and TCE.

B. LEGAL REQUIREMENTS APPLICABLE TO THE ANALYSIS

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 (see Public Resources Code section 21080.5), the CEQA environmental analysis requirements are allowed to be included in the ARB 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 Regulation.

Public Resources Code section 21159 requires that the environmental impact analysis conducted by ARB include the following: (1) an analysis of the reasonably foreseeable environmental impacts of the methods of compliance; (2) an analysis of reasonably foreseeable feasible mitigation measures; and, (3) an analysis of reasonably foreseeable alternative means of compliance with the Regulation.

Our analysis of the reasonably foreseeable environmental impacts of the methods of compliance is presented in subsections C through I below. Regarding reasonably foreseeable mitigation measures, CEQA requires an agency to identify and adopt feasible mitigation measures that would minimize any significant adverse environmental impacts described in the environmental analysis.

C. ALTERNATIVE MEANS OF COMPLIANCE

Two alternative means of compliance with the Regulation have been developed. A current compliance alternative for manufacturers of consumer products is the Alternative Control Plan (ACP). The ACP Regulation, title 17, California Code of Regulations, sections 94540-94555, is a voluntary emissions averaging program. Under the ACP, an overall limit on the VOC content of emissions from each individual product in the ACP is determined. To be approved, an ACP must demonstrate that the total VOC emissions within the ACP would not exceed the emissions that would have resulted had the products been formulated to meet the VOC limit established for each product category. In other words, some products in the ACP could exceed the established VOC limits in the Regulation as long as those increased emissions were offset by additional products that over-comply with the established VOC limits. The ACP provides manufacturers with flexibility, but preserves the overall environmental benefits of emission reductions.

Another compliance alternative that is available for manufacturers is the Innovative Products Provision specified in title 17, California Code of Regulations,

section 94511. This provision allows a manufacturer to formulate products that exceed the mass-based limit specified in the Regulation for a particular product category. The manufacturer must demonstrate that, through some characteristic of the higher VOC product, its use will result in less VOC emissions compared to a representative complying product. This alternative is also specifically designed to allow manufacturers flexibility, while preserving the emission benefits of the Regulation.

Absent use of either of these alternatives, the staff is not aware of any additional compliance means, other than direct compliance with the proposed amendments.

D. AIR QUALITY ENVIRONMENTAL IMPACTS

1. Ground-level Ozone

The primary benefit of the proposed amendments to the Regulation is the reduction in the formation of tropospheric, or ground-level, ozone by reducing VOC emissions from 15 categories of consumer products. Enhanced ground level ozone formation involves the interaction between VOCs and oxides of nitrogen (NO_x) in the presence of sunlight. For a more complete description concerning ground level ozone and health impacts related to elevated ozone concentrations, the reader is referred to Chapter IV of this report.

Staff is proposing to raise the VOC limit for Nail Polish Remover from zero percent to one percent in order to accommodate inevitable VOC formation. In addition, certain Electronic Cleaners used in specific situations are proposed to be exempted from the current category definition. These two changes will result in an emissions shortfall of 0.17 tpd, which will be mitigated by the nearly 12 tpd VOC reductions achieved from other categories during this rulemaking.

a. New VOC Standards

Reducing ozone precursor emissions, namely VOCs, will result in a positive environmental impact by lowering the concentrations of ground level ozone in the atmosphere. The proposed amendments are designed to reduce VOC emissions by 10.6 tpd, effective December 31, 2008. In 2010 this reduction would equal 11.5 tpd. The categories proposed for regulation and the corresponding VOC emission reductions are shown in Table VIII-1 below.

Total emissions from these categories in 2003 were about 26.2 tpd, and would grow to 28.6 tpd in 2010, without controls. Therefore, the staff's proposal represents about a 40 percent reduction in emissions when all limits become effective in 2010.

Table VIII-1
Proposed VOC Limits and Reductions by Product Category

Product Category	Product Form	Proposed VOC Limit (wt%)	VOC Emission Reductions (TPD)[1]
Automotive Windshield Washer Fluid: Type "A" Areas	all	25	0.30
Bathroom and Tile Cleaner	non-aerosol	1	0.13
Brake Cleaner	all	10	3.70
Carburetor or Fuel-Injection Air Intake Cleaner	all	10	2.00
Construction, Panel, and Floor Covering Adhesive	all	7	0.41
Disinfectant	aerosol non-aerosol	70 1	0.66 0.49
Engine Degreaser	aerosol	10	0.62
Floor Polish or Wax: for resilient flooring material for nonresilient floor material	 all all	 1 1	 0.43 0.05
Furniture Maintenance Product	non-aerosol	3	0.06
General Purpose Cleaner	aerosol	8	0.04
General Purpose Degreaser	aerosol	10	0.68
Laundry Starch/Sizing/Fabric Finish Product	aerosol non-aerosol	4.5 4.5	0.06 0.00
Oven Cleaner	non-aerosol	1	0.09
Sanitizer	aerosol non-aerosol	70 1	0.46 0.33
Temporary Hair Color	aerosol	55	0.13

[1] VOC emission reductions in tons per day from 2003 emissions.

b. Nail Polish Remover Limit

The Nail Polish Remover (NPR) category consists of products which are designed and labeled primarily for the purpose of removing nail polish or other nail coatings from the surface of fingernails and toenails. These products generally consist of a solvent or mixture of solvents which act to dissolve the nitrocellulose present in nail polish. Depending upon formulation, nail polish removers may have a secondary function of removing artificial nails, wraps, and tips. Nail Polish Removers were first regulated under "Phase I" of the Consumer Products Regulation adopted in October of 1990.

Under "Midterm II" of the consumer products regulation adopted in October of 1999, a VOC limit of zero percent by weight for NPR became effective in December 2004. Many existing formulations that are compliant with this standard are

comprised of acetone, an exempt solvent. Yet, a significant market exists for non-acetone products because acetone may damage artificial nails. The traditional solvent for non-acetone formulations is ethyl acetate, a VOC.

In order to meet the NPR VOC standard, as well as market demand, some manufacturers attempted to reformulate using the exempt solvent methyl acetate. Methyl acetate was suggested as a possible non-acetone reformulation option in the Initial Statement of Reasons in the Midterm II regulatory amendments when the zero percent standard was originally adopted. In October 2004, two major NPR manufacturers approached staff to discuss difficulties they had encountered with reformulated non-acetone based NPR products. The manufacturers encountered two issues resulting from the use of methyl acetate. First, a small amount of VOC impurities exist in the raw materials, up to 0.5 percent, even in the purest grade of methyl acetate. Second, methyl acetate, when in contact with water, undergoes a chemical reaction that yields methanol and acetic acid (both VOCs) as products, which continues even after the product is packaged. Over the course of conducting accelerated aging and stability testing of new formulations, the manufacturers discovered the reaction occurs at various compositions of methyl acetate, even with additives to minimize the reaction (such as pH buffers). They estimate the reaction can form approximately one percent VOC within one year after manufacture. With the adopted limit of zero percent VOC in place, these methyl acetate-based NPR products could conceivably be subject to enforcement action, despite being formulated and manufactured in good faith and distributed in a timely fashion.

To accommodate these unavoidable circumstances, staff proposes raising the NPR VOC limit to one percent by weight, to become effective December 31, 2007. Manufacturers have indicated that a one percent VOC level is achievable by using high-grade methyl acetate (which contains the lowest levels of methanol contamination) and the inclusion of additives to minimize VOC formation over time. Raising the limit amounts to an emission reduction shortfall of 0.04 ton per day, which will be offset by emission reductions resulting from the current regulatory amendments.

c. Electronic Cleaners Definition Change

In the 2004 Amendments to the Consumer Products Regulations, the Board approved a VOC limit of 75 percent by weight for "Electronic Cleaners." At the time the limit was approved, it was determined that the limit was commercially and technologically feasible. As is routinely done, before limits become effective, staff consults with stakeholders to ensure that the limits are technologically feasible. In 2005, several manufacturers indicated that they were encountering problems reformulating certain "Electronic Cleaners" to meet the 75 percent limit. These niche products are those that are used in manufacturing settings where products must be non-flammable, electrically non-conductive, have high dielectric strength, and have a high degree of solvency (Kauri-butanol (Kb) values of 45-55). Kb value is a measure of a compound's ability as a solvent). These attributes would be needed for cleaning

electronic components on a manufacturing line. Industry representatives also indicated that low-toxicity was important in this segment of the market.

Therefore, staff is proposing to exempt products from the definition, and the 75 percent VOC limit. The label for these certain electronic cleaner products must clearly display the statement: "not for retail sale" and must be sold exclusively to establishments which manufacture or construct goods or commodities. This proposal should ensure that the full range of electronic cleaning products continue to be available to the California market. However, staff will continue to evaluate the need for the exemption as additional technology becomes available. Staff has also determined that approximately 31 of the 106 "Electronic Cleaners" reported in the 2003 Survey would meet the proposed exemption. This reduces the emission reductions claimed from the category in the 2004 Amendments by 0.13 tpd. This small shortfall will be offset by the emission reductions achieved through this rulemaking.

2. Proposed Prohibition on Use of Perc, MeCl, and TCE

Staff has also evaluated the potential for VOC emission increases resulting from other proposals within this rulemaking, namely the elimination of Perc, MeCl, and TCE in four categories. Staff does not anticipate any increase in VOC emissions due to prohibiting these three chlorinated TACs in these four categories because they are not currently used in formulating these products. Our analyses follow.

Staff is proposing to prohibit the use of Perc, MeCl, and TCE, in Bathroom and Tile Cleaner; Construction, Panel, and Floor Covering Adhesive; General Purpose Cleaners and Oven Cleaners. Although no products in these categories currently contain Perc, MeCl or TCE, staff proposes to prohibit their use so that they are not used as reformulation pathways in the future. Note, however, that TCE is a VOC and is therefore an unlikely replacement for non-TAC VOCs in reformulating products to meet lower VOC limits.

3. Impact on Particulate Matter (Secondary Organic Aerosols)

Overall, our analysis found that the proposed rulemaking would not likely have a significant environmental impact on formation of PM, i.e. secondary organic aerosols (SOA). However, as detailed below, in the absence of SOA formation data for certain ingredients, and the uncertainty associated with the reformulation approaches manufacturers will pursue, it is difficult to determine definitively the full impacts that the implementation of the proposed amendments would have on ambient PM concentrations. Hence, we will continue to monitor implementation of the Regulation and reassess the impacts as more data become available. For completeness, staff has analyzed potential reformulation options and how SOA may be impacted.

Fine PM is prevalent in the urban atmosphere (see, for example, Pandis *et al.*, 1992), and ambient PM, especially those with aerodynamic diameters less than two and a half micrometers ($PM_{2.5}$) is known to have negative impacts on human health

(Schwartz *et al.*,1996; Moolgavkar and Luebeck, 1996). Like ozone, PM can be formed via atmospheric oxidation of organic compounds (Finlayson-Pitts and Pitts, 2000). Significant advances have been made in the theoretical and the experimental studies of the formation of secondary organic aerosols (SOA) (Pankow, 1994a, 1994b; Odum *et al.*, 1996; Seinfeld and Pandis,1998; Harner and Bidleman, 1998; Kleindienst, *et al.*, 1999; Yu *et al.*, 1999). In addition, modeling techniques to determine the amount of ozone as well as the amount of aerosol formed from a VOC have been established (Bowman *et al.*, 1994), and the concept similar to maximum incremental reactivity is being applied to quantitatively assess the aerosol formation potential of a VOC (i.e. incremental aerosol reactivity) (Griffin *et al.*, 1999). Further information on SOA is found in Chapter IV.

Based on the results of these studies, we now know that there is a mechanistic linkage between ozone formation and SOA formation of a VOC. Because of this relationship, the proposed amendments may also affect the SOA formation potential of consumer products. The analysis of the impact on SOA formation resulting from implementing the proposed VOC limits is detailed below.

Although most organic compounds contribute to ozone formation, SOA is usually formed from photooxidation of organic compounds with carbon numbers equal to seven or more (Grosjean and Seinfeld, 1989; Wang *et al.*, 1992). It has also been shown that aromatic compounds are more likely to participate in the formation of SOA than are alkanes (Grosjean, 1992; Pandis *et al.,* 1992). In other words, only chemicals that react fast enough in the atmosphere will generate sufficient amounts of low volatility products for forming aerosols. In general terms, the potential to form SOA among commonly used classes of VOCs used in consumer products could be described by the following order, with the lower molecular weight alkanes and ketones being least likely:

Least Likely	Lower molecular weight alkanes & ketones (7 carbons or less)
	Higher molecular weight alkanes
	Higher molecular weight aromatics (polysubstituted benzenes)
More Likely	Lower molecular weight aromatics (C7 & C8 compounds)

The analysis of the potential impact on PM formation assumes that to meet the proposed limits, in 2010 terms, will require substituting 11.5 tpd of non-VOC ingredients or exempt VOCs for 11.5 tpd VOCs. To meet the proposed limits, manufacturers generally have five reformulation options: use of exempt VOCs, such as acetone or methyl acetate; use of LVP-VOC solvents; use of water; increasing 'solids' content; or use of non-VOC propellants. While reducing overall VOC content to comply, some manufacturers may opt to use smaller amounts of 'stronger' VOCs to maintain the product's attributes. It is difficult to predict which reformulation path or combination of paths will be taken by manufacturers. However, substitution for VOCs with water, higher solids content, or non-VOC propellants would likely result in a small reduction in SOA formation. The most likely exempt VOC solvents to be used to comply, acetone and methyl acetate, both having three carbon atoms, have little potential to contribute to SOA formation. Indeed, it has been predicted that there would be no SOA yield from

acetone (Pandis *et al.,* 1992). Hence, use of these compounds could also result in a reduction in SOA.

To the extent manufacturers may reduce overall VOC content but formulate with stronger solvents could result in increased SOA formation. This is because the commonly used stronger solvents are aromatic compounds, such as xylenes and toluene, which are known to have higher SOA potentials than other commonly used VOCs. On the other hand, if product reformulation involves the substitution of an aromatic by a non-aromatic species, the SOA formation potential of the product is likely to be reduced. If VOC aromatics are replaced with LVP-VOC aromatic compounds, a decrease in SOA potential should also occur. However, substitution of LVP-VOC alkane or aromatic compounds for smaller low molecular weight alkanes could result in a slight SOA increase (Grosjean, 1992).

Because we can not predict how manufacturers will choose to reformulate, we can not fully evaluate the potential for increased SOA formation. However, it is likely to be only a slight potential for increase, if any, due to the variety of reformulation options available. Additionally, any reformulations that result in increased SOA would likely be offset by reformulations resulting in lower SOA. We will continue to monitor implementation of the Regulation and reassess the impacts as more data become available.

Other proposals within this rulemaking to prohibit TACs should have no or negligible impacts on SOA formation because replacements for these TACs (alkanes or exempt compounds) are not known to have strong SOA formation potentials.

4. Impact on Global Warming

Global warming is the process whereby emissions of anthropogenic pollutants, together with other naturally-occurring gases, absorb infrared radiation in the atmosphere, leading to increases in the overall average global temperature. Compounds of concern in global warming include the six substances identified in the Kyoto Protocol. These are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). These gases have long lifetimes in the atmosphere, from about a year to several thousand years depending on the particular gas.

Climate research has identified other species that also have the potential to significantly alter climate. These other species, which have much shorter atmospheric lifetimes than CO_2 (on the order of days or less depending on the species), typically have not been directly included in climate-related emission reduction efforts due to the scientific uncertainty regarding the magnitude or (in some cases) direction of their climate change effect (warming or cooling).

The non-Kyoto species of interest are primarily man-made pollutants emitted chiefly as byproducts of fossil fuel and biomass fuel combustion. Some difficulty arises

because several of these substances have both warming and cooling effects, with considerable remaining uncertainty as to their net effect on climate. Those species generally believed to result in net warming include carbon monoxide (CO), volatile organic compounds (VOC), hydrogen (H_2), and the fraction of particulate matter (PM) substantially consisting of black carbon (BC). With the exception of PM, the warming effect of these substances results from the formation of tropospheric ozone and methane, which themselves contribute to warming. Other substances of potential concern include nitrogen oxides (NO_x) and sulfur dioxide (SO_2), but these substances can have a cooling effect.

The metric typically used to compare the relative importance of pollutants with respect to their global warming is the Global Warming Potential (GWP). The GWP of a substance is a measure of the extra amount of heat that is trapped in the atmosphere when one kilogram of the substance is released instantaneously into it, relative to the case when one kilogram carbon dioxide is released. GWPs are calculated using computer models which incorporate the radiative heat balance of the atmosphere and the chemical kinetics of all the substances involved. The model is initially in a steady state. If a kilogram of a greenhouse gas is released, the temperature will increase until a new steady state is established. If a substance stayed in the atmosphere indefinitely, the new steady state would be permanent and the increase in temperature could be used as a measure of the GWP. However, organic compounds are readily removed from the atmosphere by various processes including photochemical reactions and wet and dry deposition. Thus, the challenge associated with the use of GWPs is the choice of time horizon when comparing substances with significantly different atmospheric lifetimes as it will have an impact on the relative importance of the pollutants with respect to global warming. The Kyoto Protocol uses GWPs calculated for a 100-year time horizon.

The GWP of a compound may reflect a direct effect as well as an indirect effect on global warming. As mentioned earlier, the direct effect is the warming due to the absorption of radiation by molecules of the compound in question. The indirect effect is due to the impact that the presence of the compound has on the concentration of other greenhouse gases. For example, VOC contribute indirectly to global warming, insofar as they react chemically in the atmosphere in ways that increase greenhouse gas concentrations, most notably, concentrations of ozone and methane.

a. Volatile Organic Compounds (VOC)

Almost all VOC have the potential to contribute directly to global warming by absorbing infrared radiation from the earth's surface. In general, the more complex a VOC, the greater its ability to absorb infrared radiation. However most VOCs have a very short atmospheric lifetime and are broken down by atmospheric reactions. Generally speaking, the exceptions to this rule are the low molecular weight alkanes and halogenated compounds. VOC also contribute indirectly to global warming via their contribution to the formation of ozone and methane, which are potent greenhouse gases. Typically, the indirect effect is the dominant path by which VOCs contribute to

global warming. The indirect forcing of VOC is still poorly quantified and requires the use of global three-dimensional chemical transport models. Accurate calculations of these effects are a difficult problem in atmospheric chemistry.

b. Carbon Dioxide (CO_2)

CO_2 is the primary man-made greenhouse gas of concern. To a limited extent, CO_2 may replace hydrocarbon propellants in some products. The 2003 Survey data indicate that CO_2 is used in certain consumer products considered for regulation, such as Brake Cleaners, Carburetor or Fuel-Injection Air Intake Cleaners, General Purpose Degreasers and Engine Degreasers. In these categories, CO_2 use is likely to increase as manufacturers reformulate to meet the lower proposed VOC limits. Other categories for which CO_2 is a probable reformulation pathway include: General Purpose Cleaners, Sanitizers, and Disinfectants. Co-benefits are expected to the extent that CO_2 replaces VOC propellants in consumer products. Specifically, less ozone and methane will be formed, thus lowering the population's exposure to a pollutant with serious health effects. Further, the contribution of CO_2 to global warming is likely less than that of the VOC being replaced. In addition, most CO_2 used as a propellant is a recycled by-product of existing processes and, therefore, does not increase global warming from a lifecycle standpoint (ARB, 1999).

c. Hydrofluorocarbons

For some aerosol products to meet the VOC limits in the proposed amendments, manufacturers may choose to replace some or all the typical hydrocarbon propellants with HFC-152a or HFC-134a. These compounds are exempted as VOCs under the Regulation. However, at this point, HFC-152a is the chief HFC alternative for hydrocarbon propellants in consumer products due to its significantly lower GWP (120) compared to HFC-134a (1300) (Applegate, 1995). The chemical HFC-152a was also recognized as the refrigerant of choice in ARB's greenhouse gas emission regulation for light-duty vehicles since, at that time, it was a leading technology option. At present, staff recognizes that the refrigerant industry is now actively pursuing the development of HFC refrigerants in the sub-100 GWP range for the mobile air conditioning industry. If successful deployment of such HFC refrigerants is achieved for the vehicle sector, those refrigerants may become viable propellant options for consumer products. Therefore, staff must continue to follow these developments thus facilitating the use of the most viable options for addressing the consumer projects regulatory requirements as well as reducing or minimizing the emissions of pollutants contributing to climate change.

Staff believes that in four categories under consideration for regulation, Brake Cleaners, Disinfectants, Sanitizers, and aerosol Temporary Hair Color, HFC-152a may be a potential reformulation option. If VOC propellants in these categories was replaced with HFC-152a, total emissions of HFC-152a would be 1.29 tpd. This represents a worst-case scenario. Staff believes usage would be considerably less due to the other reformulation options available.

Also, when cost considerations are factored in (HFC-152a is about $1.77 per pound, versus VOC propellants at $0.50 per pound), it is anticipated that manufacturers will use as little HFC-152a as possible, or none at all, when reformulating their aerosol products. ARB staff does not expect the price of HFC-152a to change appreciably in the near future, thus a significant increase in use is not anticipated. Further, the development of new lower-GWP refrigerants may also provide additional options in the future.

Based on 2003 Survey data, HFC-134a is a probable reformulation option for aerosol Temporary Hair Color products. If hydrocarbon propellant in this category were entirely replaced with HFC-134a, emissions of this compound would be approximately 0.07 tpd. A slight chance also exists that HFC-134a could be used in General Purpose Degreasers and Brake Cleaners. We do not predict increased usage of this compound due to its higher GWP and because its use is not recommended except in certain specific uses. But most importantly, as mentioned above, the chemical industry may have in the near-term replacement options for HFC-134a for the mobile air conditioning sector. These options will need to be considered for potential application to consumer products.

Again, when cost considerations are factored in (HFC-134a is about $3.50 per pound, versus VOC propellants at $0.50 per pound), it is anticipated that manufacturers will use as little HFC-134a as possible, or none at all, when reformulating their aerosol products.

Based on the analysis presented here, the proposed action will lead to reductions in emissions of VOC with the potential (depending upon the alternative used) for a small change in the emissions of global warming pollutants. Staff believes that the potential increase in global warming pollutant emissions are tempered by the agency's need to be mindful of health protection via reduction of ozone precursors. As presented here, strategies for reducing VOC emissions through the promotion of alternative low or non-VOC propellants must also consider the impact on emissions of global warming pollutants. In consideration of the health benefits associated with lower VOC emissions as well as the availability and continued development of low-GWP alternatives, the proposed amendments will lead to an improvement in public health by advancing efforts to meet air quality standards. Other proposed amendments relating to the prohibitions on use of TACs are not expected to lead to increases in emissions of global warming pollutants as the likely replacements are anticipated to consist of VOC or low-GWP exempt compounds.

5. Impact on Stratospheric Ozone Depletion

The ARB staff has determined that the proposed amendments should not have an adverse impact on stratospheric ozone depletion. As detailed below, the compounds of concern, that are currently used in some consumer products, are being phased out. This should result in a net small decrease in stratospheric ozone depletion.

The stratospheric ozone layer shields the earth from harmful ultraviolet (UV) radiation. Depletion of the earth's ozone layer allows a higher penetration of UV radiation to the earth's surface. This increase in UV radiation penetration leads to a greater incidence of skin cancer, cataracts, and impaired immune systems. Reduced crop yields and diminished ocean productivity are also anticipated. Because the chemical reactions which form ground level ozone are driven by UV radiation, it is conceivable that a reduction in stratospheric ozone may also result in an increase in the formation of photochemical smog because of the increased levels of UV radiation on the earth's surface (ARB, 2000c). The chemicals most implicated as causing stratospheric ozone depletion are chlorofluorocarbons (CFCs) and halons (U.S. EPA, 2003). Specifically, the chlorine or bromine atoms released by photolysis of the CFCs or halons react in chain reactions leading to the catalytic destruction of ozone (Finlayson-Pitts and Pitts, 2000).

Because of this climatic problem, the Montreal protocol was enacted in 1989, to phase out a number of CFCs and HCFCs. As a signatory of this protocol, the United States, in the Federal Clean Air Act of 1990 established timetables for ceasing production (see part 40, Code of Federal Regulations, section 602). In general, the protocol establishes dates by which certain compounds can no longer be manufactured; however, existing stocks can continue to be used in some applications until exhausted.

The VOC limit affecting Electronic Cleaners was proposed in the 2004 Amendments. This rulemaking is simply proposing to exempt certain Electronic Cleaners form the definition proposed in the 2004 Amendments. As such, any potential adverse environmental impacts resulting from the VOC limits affecting Electrical and Electronic Cleaners were addressed in the Initial Statement of Reasons for the 2004 Amendments. Therefore, we do not expect any increase in that ozone depleting compound.

Because it lacks chlorine, HFC-152a probably contributes only slightly to ozone depletion (Wallington *et al.*, 1994). As evidence of this, HFC-152a is not included on the list of compounds that are scheduled for phase-out under the federal Clean Air Act requirements. If manufacturers choose HFC-152a as a replacement for hydrocarbon propellants, no additional decrease in stratospheric ozone is expected.

E. POTENTIAL TOXIC AIR CONTAMINANTS IMPACTS

1. Background

As part of our obligations under CEQA, the ARB staff is required to evaluate and mitigate potential adverse environmental impacts resulting from regulatory proposals. Also, pursuant to Health and Safety Code section 39650 et seq., the ARB is required to identify and control toxic air contaminants (TACs). The Health and Safety Code defines a TAC as "...an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health." Moreover, in accordance with section 39666 of the Health and Safety Code, for TACs for which no safe exposure threshold has been established, the ARB is required to ".... reduce emissions to the lowest level achievable through application of best available control technology or a more effective control method...."

Several chemicals currently used in the consumer product formulations considered for regulation have been identified as TACs. An increased or continued use of TACs in any of the consumer product categories considered for regulation could lead to a potential adverse environmental impact. ARB staff has evaluated this potential and has concluded that there would be a potential adverse environmental impact of implementing the VOC limits. Therefore, staff is proposing mitigation measures designed to ensure that use of TACs will be reduced or prohibited, resulting in a positive environmental impact.

2. VOC Solvents

Volatile organic compound solvents commonly used in consumer products that have been identified as TACs, include xylenes, ethyl benzene, toluene, trichloroethylene, hexane, and methyl ethyl ketone (ARB, 2003). Table VIII-2 describes the available data on toxicological endpoints for these compounds. Note that although TCE is a VOC solvent, its effects will be described along with the other chlorinated solvents below.

Table VIII-2
Pollutant-Specific Health Effects for Select VOC TACs of Concern

Compound	Total Emissions TPY[1]	Toxicological Endpoints[2]	
		Acute	Chronic
Xylenes	6,489.2	Eye; Respiratory System	Nervous System; Respiratory System
Hexanes	453.0	N/A	Nervous System
Methyl Ethyl Ketone	633.0	Eyes; Respiratory System	N/A
Toluene	2,218.0	Central Nervous System	Reproductive; Developmental
Ethyl Benzene	98.8	N/A	Liver; Kidney; Endocrine

[1] 2003 Consumer Products Survey data (ARB, 2003)
[2] (OEHHA, 2005b)

Staff is not proposing specific mitigation measures to reduce these VOC TACs. This is because the Regulation is designed to reduce the VOC content of consumer products. Products containing these compounds will likely have to reduce the amounts of these VOCs contained in current products in order to comply with the applicable VOC limit. The proposed limits would reduce VOC emissions by about 40 percent. Although we can not quantify the reduction at present, compliance with VOC limits should lead to a reduction in the use of TACs, resulting in a positive environmental impact. As always we will continue to monitor the use of these compounds through subsequent surveys to determine usage trends.

3. Chlorinated Solvents

Staff believes that specific mitigation measures are necessary to restrict the use of three chlorinated solvents, Perc, MeCl, and TCE because of their potential to cause cancer. Two of these TACs used in some consumer products, MeCl, and Perc, are specifically exempted from the VOC definition (section 94508 of the Regulation) in recognition of their very low ozone-forming capability. Thus, the potential exists that to meet VOC limits, manufacturers could reformulate using these exempt VOC TACs leading to an adverse impact. Trichloroethylene is regulated as a VOC, such that its use should not increase as products reformulate to meet VOC limits. However, because of its toxicity impacts we are proposing a specific mitigation measure to address its use. Below, we provide some general information on toxicity, physical properties and the usage of Perc, MeCl, and TCE.

a. Pollutant-Specific Health Effects Values

Presented below in Table VIII-3 are pollutant-specific health effects values developed for Perc, MeCl, and TCE to characterize the relationship between a person's exposure to these TACs and the incidence or occurrence of an adverse health effect. A unit risk factor (URF) or cancer potency factor is used when estimating potential cancer risks and reference exposure levels (RELs) are used to assess potential non-cancer health impacts. Also included in Table VIII-3 are the non-cancer acute and chronic toxicological endpoints for Perc, MeCl, and TCE. A further discussion of the health effects that may result from exposure to Perc, MeCl, and TCE follows.

Table VIII-3
Pollutant-Specific Health Effects Values Used for Determining Potential Health Impacts [1]

Compound	Cancer Unit Risk Factor $(\mu g/m3)^{-1}$	Non-cancer Reference Exposure Levels ($\mu g/m^3$)		Toxicological Endpoints	
		Acute	Chronic	Acute	Chronic
Perchloroethylene (Perc)	5.9 E-6	20,000	35	central nervous system; eye & respiratory irritation	kidney; alimentary system (liver)
Methylene Chloride (MeCl)	1.0 E-6	14,000	400	central nervous system	cardiovascular system; nervous system;
Trichloroethylene (TCE)	2.0 E-6	none	600	none	nervous system; eyes

[1] Health effects values and toxicological endpoints were obtained from three sources (OEHHA, 2000, 2005a, 2005b).

A URF is defined as the estimated upper-confidence limit (usually 95 percent) probability of a person contracting cancer as a result of constant exposure to a concentration of 1µg/m3 over a 70-year lifetime. In other words, using the URF for Perc as an example, which is 5.9×10^{-6} (microgram per cubic meter)$^{-1}$ or $(\mu g/m^3)^{-1}$, the potential excess cancer risk for a person continuously exposed over a 70-year lifetime to $1 \mu g/m^3$ of Perc is estimated to be no greater than 5.9 chances in 1 million (ARB, 2000a).

A Reference Exposure Level (REL) is used as an indicator of potential non-cancer adverse health effects and is defined as a concentration level at or below which no adverse health effects are anticipated. Reference Exposure Levels are designed to protect most sensitive individuals in the population by including safety factors in their

development and can be created for both acute and chronic exposures. An acute exposure is defined as one or a series of short-term exposures generally lasting less than 24 hours. Consistent with risk guidelines, a 1-hour exposure is used to determine acute non-cancer impacts. Chronic exposure is defined as long-term exposure usually lasting from one year to a lifetime. Generally, hazard indices of less than 1.0 are not considered to be a concern to public health. A hazard index is the ratio of the modeled concentration for a toxic pollutant and the reference exposure level for that pollutant (ARB, 2000a).

b. Physical Properties and Potential Health Effects of Perchloroethylene, Methylene Chloride, and Trichloroethylene

This section summarizes the physical properties, the categories where they could be used, and cancer and non-cancer impacts that can result from exposure to Perc, MeCl, and TCE. None of the products in the four categories for which the TAC prohibition is proposed contain any of the TACs proposed for prohibition.

I. Perchloroethylene (Perc) or Tetrachloroethylene

aa. Physical Properties of Perc

Perchloroethylene is a volatile chlorinated aliphatic hydrocarbon compound containing a double bond. At room temperature, Perc is a non-flammable, colorless, dense liquid with an ethereal odor. Although relatively insoluble in water, it is miscible in alcohol, ether, chloroform, and benzene. Perc decomposes slowly in water to yield trichloroacetic and hydrochloric acids, and is oxidized by strong oxidizing agents. The physical properties of Perc are shown below in Table VIII-4.

Table VIII-4
Physical Properties of Perchloroethylene (Perc)

CAS Number:	127-18-4
Molecular Formula:	C_2Cl_4
Molecular Weight:	165.85
Boiling Point:	121 °C at 760 mm Hg
Melting Point:	-22 °C
Vapor Pressure:	18.47 mm Hg at 25 °C
Vapor Density:	5.7 (air = 1)
Density/Specific Gravity:	1.6230 at 20/4 °C
Log Octanol/Water Partition Coefficient:	3.40
Conversion Factor:	1 ppb = 6.78 $\mu g/m^3$

bb. Sources and Emissions of Perc

Perchloroethylene is not currently used in Bathroom and Tile Cleaner; Construction, Panel and Floor Covering Adhesive; General Purpose Cleaners; or

Oven Cleaners. However, if it is not prohibited for use in these categories, it could conceivably be used as an avenue for compliance with the proposed lower VOC standard, increasing human exposure.

cc. Health Impacts

Exposure to Perc may result in both cancer and non-cancer health effects. The probable route of human exposure to Perc is inhalation (ARB, 1997).

i. Cancer

The Office of Environmental Health Hazard Assessment (OEHHA) staff has performed an extensive assessment of the potential health effects of Perc, reviewing available carcinogenicity data. OEHHA concluded that Perc is a potential human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified Perc as a TAC in October 1991 (ARB, 1991). The State of California under Proposition 65 listed Perc as a carcinogen in April 1988 (OEHHA, 2006). Table VIII-3 presents the current health effects values that are used for determining the potential health impacts.

In 1990, the U.S. Congress listed Perc as a hazardous air pollutant (HAP) in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The U.S. EPA has classified Perc in Group B2/C, as a probable human carcinogen, on the basis of sufficient evidence for carcinogenicity in animals and inadequate evidence in humans. The International Agency for Research on Cancer (IARC) has classified Perc in Group 2A, as a probable human carcinogen, based on sufficient evidence in animals and limited evidence in humans (ARB, 1997).

Epidemiological studies have provided some indication that the use of dry cleaning solvents, primarily Perc, poses an increased risk of cancer for exposed workers. However, investigators were unable to differentiate among exposures to various solvents, and other possible confounding factors, like smoking, were not evaluated. Perc increased the incidence of hepatocellular tumors in laboratory mice after oral and inhalation exposure and mononuclear cell leukemia and kidney tumors in rats after inhalation (ARB, 1997).

ii. Non-Cancer

Short-term (acute) and long-term (chronic) exposure to Perc may result in non-cancer health effects. Acute toxic health effects resulting from short term exposure to high levels of Perc may include headaches, dizziness, rapid heartbeat, and irritation or burns on the skin, eyes, or respiratory tract. Massive acute doses can induce central nervous system depression resulting in respiratory failure. Chronic exposure to lower Perc concentration levels may result in dizziness, impaired judgement and perception, and damage to the liver and kidneys (ARB, 2000a). Workers have shown signs of liver toxicity following chronic exposure to Perc, as well as kidney dysfunction and

neurological effects. Effects on the liver, kidney, and central nervous systems from chronic inhalation exposure to Perc have been reported in animal studies (ARB, 1997).

In addition to OEHHA listing Perc as having acute and chronic non-cancer RELs (OEHHA, 2000; OEHHA, 2005a), the U.S. EPA established an oral Reference Dose (RfD) for Perc of 0.01 milligrams per kilogram per day based on hepatotoxicity in mice and weight gain in rats. The U.S. EPA has not established a Reference Concentration (RfC) for Perc (ARB, 1997). Table VIII-3 presents the current health effects values that are used to determine the potential health impacts.

Epidemiological studies of women working in the dry cleaning industry showed some adverse reproductive effects, such as menstrual disorders and spontaneous abortions, but study design prevented significant conclusions. Women exposed to drinking water contaminated with solvents including Perc, showed some evidence of birth defects. Inhalation exposure of pregnant rodents to 300 parts per million Perc produced maternal toxicity and fetotoxicity manifested as developmental delays and altered performance in behavioral tests in the offspring of exposed mice and rats. However, Perc is not considered to be a teratogen (ARB, 1997).

II. Methylene Chloride

aa. Physical Properties of Methylene Chloride

Methylene chloride is a volatile, nonflammable, colorless, liquid with a sweetish chloroform-like odor. It is slightly soluble in water and miscible with alcohol, ether, and dimethylformamide. In the absence of moisture, at ordinary temperatures, MeCl is relatively stable. In dry air, MeCl decomposes at temperatures exceeding 120 °C. Methylene chloride evaporates relatively quickly from water. Possible thermal breakdown products of MeCl include phosgene, chlorine, and hydrogen chloride. The physical properties of MeCl are shown below in Table VIII-5.

Table VIII-5
Physical Properties of Methylene Chloride (Dichloromethane)

CAS Number:	75-09-2
Molecular Formula:	CH_2Cl_2
Molecular Weight:	84.94
Boiling Point:	39.75 °C at 760 mm Hg
Melting Point:	-95 °C
Vapor Pressure:	349 mm Hg at 20 °C
Vapor Density:	2.93 (air = 1)
Density/Specific Gravity:	1.3255 at 20/4 °C
Log Octanol/Water Partition Coefficient:	1.30
Conversion Factor:	1 ppm = 3.47 mg/m^3

bb. Sources and Emissions of Methylene chloride

Methylene chloride is not currently used in Bathroom and Tile Cleaner; Construction, Panel, and Floor Covering Adhesive; General Purpose Cleaners; or Oven Cleaners. However, if it is not prohibited for use in these categories, it could conceivably be used as an avenue for compliance with the proposed lower VOC standard, increasing human exposure.

cc. Health Impacts

Exposure to MeCl (also known as dichloromethane) may result in both cancer and non-cancer health effects. The probable route of human exposure to MeCl is inhalation (ARB, 1997).

i. Cancer

The OEHHA staff has performed an extensive assessment of the potential health effects of MeCl, reviewing available carcinogenicity data. The OEHHA staff agreed with U.S. EPA and IARC that MeCl is either a possible or probable human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified MeCl as a TAC in July 1989 (ARB, 1989). The State of California under Proposition 65 listed MeCl as a carcinogen in April 1988 (OEHHA, 2006). Table VIII-3 presents the current health effects values that are used to determine potential health impacts.

In 1990, the U.S. Congress listed MeCl as a HAP in subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The U.S. EPA has classified MeCl in Group B2, as a probable human carcinogen. The IARC has classified MeCl in Group 2B, as a possible human carcinogen (ARB, 1997).

ii. Non-Cancer

Short-term (acute) and long-term (chronic) exposure to MeCl may result in non-cancer health effects. MeCl vapor is irritating to the eyes, respiratory tract, and skin. It is also a central nervous system depressant including decreased visual and auditory functions and may cause headache, nausea, and vomiting. Acute toxic health effects resulting from short term exposure to high levels of MeCl may include pulmonary edema, cardiac arrhythmias, and loss of consciousness. Chronic exposure can lead to bone marrow, hepatic, and renal toxicity. MeCl is metabolized by the liver with resultant carboxyhemoglobin formation (ARB, 1997).

OEHHA has adopted for MeCl acute and chronic non-cancer RELs (OEHHA, 2000; OEHHA, 2005a), the U.S. EPA established an oral Reference Dose (RfD) for MeCl of 0.06 milligrams per kilogram per day based on liver toxicity in rats, and is

currently reviewing a Reference Concentration (RfC) (ARB, 1997). Table VIII-3 presents the current health effects values that are used to determine potential health impacts.

No information on adverse reproductive effects in humans from inhalation or oral exposure has been found, but fetotoxicity was observed in pregnant rodents exposed by inhalation to high concentrations of MeCl throughout pregnancy as evidenced by reduced fetal body weight and reduced skeletal ossification (ARB, 1997).

III. Trichloroethylene

aa. Physical Properties of Trichloroethylene

Trichloroethylene is a chlorinated aliphatic hydrocarbon compound containing a double bond. It is a dense, nonflammable, volatile, colorless liquid which is only slightly soluble in water but miscible with organic solvents and other halogenated compounds. Most fixed and volatile oils are dissolved by TCE. It is lipophilic. Trichloroethylene has an odor threshold of 28 parts per million (ppm) and smells similar to ether or chloroform. The physical properties of TCE are shown below in Table VIII-6.

Table VIII-6
Physical Properties of Trichloroethylene (TCE)

CAS Number:	79-01-6
Molecular Formula	C_2HCl_3
Molecular Weight:	130.40
Boiling Point:	86.7 °C
Melting Point:	-73 °C
Flash Point:	89.6 °C
Vapor Pressure:	100 mm Hg at 32 °C
Vapor Density:	4.53
Density:	1.4649 at 20/4 °C
Log Octanol/Water Partition Coefficient:	2.42
Conversion Factor:	1 ppb = 5.33 µg/m^3

bb. Sources and Emissions of TCE

Trichloroethylene is not currently used in Bathroom and Tile Cleaner; Construction, Panel, and Floor Covering Adhesive; General Purpose Cleaners; or Oven Cleaners. However, if it is not prohibited for use in these categories, it could conceivably be used as an avenue for compliance with the proposed lower VOC standard, increasing human exposure.

cc. Health Impacts

Exposure to TCE may result in both cancer and non-cancer health effects. The probable routes of human exposure to TCE are inhalation and ingestion (ARB, 1997).

i. Cancer

The OEHHA staff has performed an extensive assessment of the potential health effects of TCE, reviewing available carcinogenicity data. The OEHHA staff agrees with U.S. EPA and IARC that TCE is a probable human carcinogen with no identifiable threshold below which no carcinogenic effects are likely to occur. The Board formally identified TCE as a TAC in October 1990 (ARB, 1990). The State of California under Proposition 65 listed TCE as a carcinogen in April, 1988 (OEHHA, 2006). Table VIII-3 presents the current health effects values that are used to determine potential health impacts.

In 1990, the U.S. EPA listed TCE as a HAP pursuant to subsection (b) of Section 112 of the Federal Clean Air Act (42 U.S.C. 7412). The U.S. EPA has classified TCE in Group B2/C, as a probable human carcinogen. The International Agency for Research on Cancer classified TCE in Group 2A, as a probable human carcinogen, based on sufficient evidence in animals and limited evidence in humans (ARB, 1997).

The U.S. EPA considers the epidemiologic data on TCE carcinogenicity in humans to be inconclusive. Increases in testicular cancer have been reported in inhalation studies in animals. Carcinogenic responses to TCE inhalation studies in animals are increased incidences of hepatocellular carcinoma and adenoma in male mice; lung adenocarcinomas and malignant lymphomas in female mice; malignant liver tumors in B6C3F1 mice; and renal tumors in rats (ARB, 1997).

ii. Non-Cancer

Short-term (acute) and long-term (chronic) exposure to TCE may result in non-cancer health effects. TCE is a central nervous system depressant and has been used as an anesthetic. It is mildly irritating to the eyes and respiratory tract. Occupational exposure to TCE has resulted in nausea, headache, loss of appetite, weakness, dizziness, ataxia, and tremors. Acute exposures to high concentrations have caused irreversible cardiac arrhythmias, nerve and liver damage and death. Chronic exposure to TCE has also been shown to cause respiratory irritation, renal toxicity, and immune system depression. Alcohol consumption in humans increases the toxicity of TCE and causes "degreaser's flush," which are red blotches on the skin (ARB, 1997).

OEHHA has adopted a chronic non-cancer REL for TCE (OEHHA, 2005a). Table VIII-3 presents the current health effects values that are used to determine potential health impacts. The U.S. EPA currently is reviewing the Reference Concentration (RfC) and the oral Reference Dose (RfD) for TCE (ARB, 1997).

There is inadequate information to determine whether TCE causes reproductive toxicity in humans. One study reported increased miscarriages in nurses exposed to TCE as well as other anesthetics. An association was found between elevated levels of contaminants, including TCE, in drinking water and congenital heart disease in children. Other studies have not reported adverse reproductive effects in humans exposed to TCE in drinking water. In animal studies, an increase in abnormal sperm morphology in mice exposed by inhalation was reported. Exposure of rats and mice to TCE by inhalation causes a significant delay in fetal maturation and an increase in embryotoxicity (ARB, 1997).

c. Proposed Mitigation Measures to Address the Use of Perc, MeCl, and TCE

In this Rulemaking staff is proposing to prohibit the use of Perc, MeCl, and TCE in Bathroom and Tile Cleaner; Construction, Panel, and Floor Covering Adhesives; General Purpose Cleaner; and Oven Cleaner. This proposal is based on data suggesting that there would be potential cancer increases resulting from their use. In proposing this prohibition we are relying on previous work conducted by ARB staff.

Specifically we are relying on three previous rulemakings. To review the complete analyses relied upon to propose these prohibitions, the reader is referred to the following three documents:

1. Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities, March 10, 2000 (ARB, 2000a).

2. Initial Statement of Reasons for the Proposed Amendments for the California Consumer Products Regulation Relating to Aerosol Adhesives, April 7, 2000 (ARB, 2000b).

3. Initial Statement of Reasons for the Proposed Amendments to the Regulation for Reducing Volatile Organic Compound Emissions from Aerosol Coating Products and Proposed Tables of Maximum Incremental Reactivity Values, and Proposed Amendments to Method 310, "Determination of Volatile Organic Compounds in Consumer Products," May 5, 2000 (ARB, 2000c).

In each of the above rulemakings, staff found that use of these chlorinated compounds posed an unnecessary health hazard. Based on modeling results showing the potential for increased cases of cancer, and because many alternative products were available, the ARB, in 2000, prohibited the use of Perc, MeCl, and TCE in General Purpose Degreasers designed for automotive use, Engine Degreasers, Brake Cleaners, Carburetor and Fuel Injection Cleaners, aerosol adhesives, and aerosol coatings. In

2004, the ARB prohibited the use of these three chlorinated solvents in Adhesive Removers, Contact Adhesives, Electrical Cleaners, Electronic Cleaners, Footwear or Leather Care Product, and Graffiti Removers and General Purpose Degreasers.

The proposed prohibition on use of Perc, MeCl, and TCE in Bathroom and Tile Cleaner; Construction, Panel, and Floor Covering Adhesive; General Purpose Cleaner; and Oven Cleaner would align with State law that requires adverse impacts to be mitigated, and the use of Best Available Control Technology (BACT) in instances where no safe exposure threshold is known. Staff has determined that the proposed prohibition is necessary to mitigate potential adverse impacts that would result from implementing VOC limits for these categories, and to ensure a level playing field among all products.

4. Summary

The prohibition of chlorinated solvents is being proposed as a mitigation measure under the California Environmental Quality Act (Public Resources Code section 2100 et seq.). An alternative basis for the prohibition, however, is the authority granted the ARB to control toxic air contaminants (TACs) under Health and Safety Code section 39665 et seq. This section E, comprises the "needs assessment" report for the prohibition on chlorinated solvents, as specified in Health and Safety Code section 39665.

Additional information to support the proposed prohibition on use of Perc, MeCl, and TCE in Bathroom and Tile Cleaner; Construction, Panel and Floor Covering Adhesive; General Purpose Cleaners; and Oven Cleaners are contained in other documents and within other chapters of this Initial Statement of Reasons. Information regarding sources of these TACs (sources of emissions other than what is discussed in this Chapter) and atmospheric persistence has already been presented in the Initial Statement of Reasons for the Proposed Airborne Toxic Control Measure for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities, March 10, 2000 (ARB, 2000a). The reader is referred to this document for further information.

More detailed information on alternative products and chemicals that can be used as replacements to Perc, MeCl, and TCE is contained in Chapter VI of this report. Costs for reformulating and cost effectiveness of the proposal are contained in Chapter VII of this report.

In the federal Clean Air Act Amendments of 1990, the United States Environmental Protection Agency (U.S. EPA) identified Perc, MeCl, and TCE as hazardous air pollutants (HAPs) because evidence indicated the substances may have adverse effects on human health or the environment. As of the writing of this report, the U.S. EPA has not promulgated a comparable NESHAP control measure specifically for consumer products containing Perc, MeCl, or TCE. The U.S. EPA has adopted NESHAP standards which control emissions of these HAPs from other sources. These other measures are described in the ATCM for AMR facilities (ARB, 2000a).

To summarize, staff finds that the proposed prohibition on use of Perc, MeCl, and TCE in Bathroom and Tile Cleaner; Construction, Panel, and Floor Covering Adhesive; General Purpose Cleaners; and Oven Cleaners is necessary to reduce the health risk associated with use of these compounds. Staff has identified the potential for increased chances of contracting cancer from using products containing these compounds. The proposed prohibitions are necessary to mitigate potential adverse impacts that would result from implementing VOC limits for these categories. The prohibitions would also align with State law that requires use of BACT in instances where no safe exposure threshold is known.

F. RISK ASSESSMENT FOR REDUCED EXPOSURE TO OZONE AND TACS

The actual health risk reductions that would result from reducing VOC emissions, if the staff's proposal were to be adopted, is not quantified in this report. However, qualitatively, we are able to conclude that reducing VOC emissions, in any amount, will result in incremental improvement of the public's health--whether it be in fewer incidences of asthma or hospitalizations, improvement in lung function, or reduced premature deaths.

The VOC reductions from the proposed amendments are designed as partial fulfillment of the State Implementation Plan (SIP). Thus one can conclude that increments of progress towards attainment improve the public's health. The proposed amendments will also likely reduce PM (secondary organic aerosols (SOA)). However, our focus here is on reducing ground level ozone. The impacts of our proposal on SOA formation are not clear, although we do not expect a disbenefit.

The health risks associated with ozone exposure have been known for many years and are discussed in detail in Chapter IV. Studies have shown that when inhaled, even at relatively low levels, ozone can impact lung tissue and lung function. The greatest risk is to those who are more active outdoors during smoggy periods, such as children, athletes, and outdoor workers. Exposure to levels of ozone above the current ambient air standard leads to lung inflammation and lung tissue damage, and a reduction in the amount of air inhaled into the lungs. Recent evidence has, for the first time, linked the onset of asthma to exposure to elevated ozone levels in exercising children (McConnell *et al.*, 2002).

The proposed amendments to the Regulation are designed to achieve the maximum feasible VOC emission reduction from the categories proposed for regulation at this time. Based on predicted emissions in 2010, these reductions from adopting the amendments would result in a total of about 11.5 tpd from 15 product categories. This represents about a 40 percent reduction in VOC emissions from these categories. This compares favorably with other consumer product regulations adopted by ARB. Historically, emission reductions from all regulated categories have been reduced by 50 percent.

Because of the potential health impacts associated with elevated concentrations of ozone, any decrease in ozone precursors, namely VOCs, benefits the health of all Californians.

Table VIII-7
Summary of VOC Reductions in Categories Proposed for Regulation

Product Category	Product Form	Proposed VOC Limit (wt %)	VOC Emission Reductions (TPD)[1]
Automotive Windshield Washer Fluid: Type "A" Areas	all	25	0.13
Bathroom and Tile Cleaner	non-aerosol	1	0.20
Brake Cleaner	all	10	3.70
Carburetor or Fuel-Injection Air Intake Cleaner	all	10	2.00
Construction, Panel, and Floor Covering Adhesive	all	7	0.41
Disinfectant	aerosol non-aerosol	70 1	0.66 0.49
Engine Degreaser	aerosol	10	0.62
Floor Polish or Wax: for resilient flooring material for nonresilient floor material	 all all	 1 1	 0.43 0.05
Furniture Maintenance Product	non-aerosol	3	0.06
General Purpose Cleaner	aerosol	8	0.08
General Purpose Degreaser	aerosol	10	0.20
Laundry Starch/Sizing/Fabric Finish Product	aerosol non-aerosol	4.5 4.5	0.06 0.00
Oven Cleaner	non-aerosol	1	0.09
Sanitizer	aerosol non-aerosol	70 1	0.46 0.33
Temporary Hair Color	aerosol	55	0.13

[1] VOC emissions reductions from 2003 emissions.

We are better able to assess the reduced health risk associated with prohibiting the use of the chlorinated solvents Perc, MeCl, and TCE in Bathroom and Tile Cleaner; Construction, Panel, and Floor Covering Adhesive; General Purpose Cleaner; and Oven Cleaner. Overall, the proposed amendments would prevent chlorinated solvent emissions by as much as 0.83 tpd annually in 2008, which could prevent increased cancer risk. It should also be noted that the scenarios analyzed to determine increased cancer risk evaluated concentrations in the outdoor air. It is likely that, in indoor environments, workers' and other end-users' chances of increased cancers would be higher from use of products containing these chlorinated solvents.

In summary, our health risk analysis shows that, by achieving these VOC reductions, the proposed amendments would reduce health risks posed by ground level ozone by slightly lowering ambient concentrations. Moreover, a substantial number of potential excess cancers would likely be prevented by prohibiting the use of chlorinated TACs. Table VIII-7 summarizes the VOC reductions anticipated in each category.

G. OTHER POTENTIAL ENVIRONMENTAL IMPACTS

Solid Waste Disposal

We do not expect an adverse impact on solid waste disposal from the proposed amendments relating to VOC limits, or the proposed prohibition on use of chlorinated solvent TACs Perc, MeCl, and TCE. The Regulation is designed so that all current product forms will be available. Because of this, we do not anticipate any changes in packaging or disposal due to the amendments.

Impacts on Waste Water

Sanitation districts have been concerned about the amount of chlorinated compounds found in the waste effluent at treatment plants. Currently, many treatment plants do not have the equipment necessary to process industrial wastes such as chlorinated compounds and these compounds have been detected at elevated levels at some facilities. Over the last several years, increased influent concentrations of Perc were observed at several wastewater treatment plants. The influent concentrations of Perc have been high enough to potentially cause violations of the plants' discharge limit of 5 micrograms per liter (µg/L) (ARB, 2000a).

The proposed prohibition of Perc, MeCl and TCE in four categories of consumer products would not alleviate sanitation districts' current concerns with Perc. However, the proposed prohibition of Perc, MeCl, and TCE from these categories proposed for regulation may prevent an increase in the amount of chlorinated solvents reaching the storm drains and the waste water treatment plants if these products are misused or improperly discarded.

In summary, with regard to solid waste and water quality impacts, staff finds that the proposed rulemaking would not adversely impact solid waste or water quality. In fact, the proposal should result in no impact on solid waste and would have a neutral-to-positive impact on water quality.

H. 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 ARB is committed to evaluating community impacts of proposed regulations, including environmental justice concerns.

Consumer products are considered area sources and, as such their use is not focussed in a particular area leading to a potential "hot spot." Generally, use of consumer products is fairly uniform across the State, tracking with housing units, and their emissions are spread over the course of a day, rather than concentrated at a particular time of day. For these reasons, we do not believe that people of any given race, culture, or income would be more impacted than any others would. All Californians should benefit equally from the reduction in VOC emissions from the consumer product categories proposed for regulation, as well as from the prohibition on use of chlorinated solvents that are TACs.

REFERENCES

1. Air Resources Board, Technical Support Document. Proposed Identification of Methylene Chloride as a Toxic Air Contaminant, Part B Report. May 1989. (ARB, 1989)

2. Air Resources Board, Staff Report/Executive Summary, and Part B. Proposed Identification of Trichloroethylene as a Toxic Air Contaminant. August 1990. (ARB, 1990)

3. Air Resources Board, Initial Statement of Reasons for Rulemaking, Staff Report/Executive Summary, and Part B. Proposed Identification of Perchloroethylene as a Toxic Air Contaminant. August 1991. (ARB, 1991)

4. Air Resources Board. Toxic Air Contaminant Identification List – Summaries. September 1997. (ARB, 1997)

5. Air Resources Board, Technical Support Document. Initial Statement of Reasons for Proposed Amendments to the California Consumer Products Regulation. September 10, 1999. (ARB, 1999)

6. Air Resources Board, Staff Report. Initial Statement of Reasons for the Proposed Airborne Toxic Control Measures for Emissions of Chlorinated Toxic Air Contaminants from Automotive Maintenance and Repair Activities. March 10, 2000. (ARB, 2000a)

7. Air Resources Board, Staff Report. Initial Statement of Reasons for the Proposed Amendments to the California Consumer Products Regulation Relating to Aerosol Adhesives. April 7, 2000. (ARB, 2000b)

8. Air Resources Board. Initial Statement of Reasons for the Proposed Amendments to the Regulation for Reducing Volatile Organic Compound Emissions from Aerosol Coating Products and Proposed Tables of Maximum Incremental Reactivity (MIR) Values, and Proposed Amendments to Method 310, "Determination of Volatile Organic Compounds in Consumer Products. May 5, 2000. (ARB, 2000c)

9. Air Resources Board. 2003 Consumer and Commercial Products Survey. November, 2004. (ARB, 2003)

10. Applegate, L. E. HFC-152a: A Valuable Propellant for the Reduction of Volatile Organic Compounds. Spray Technology & Marketing. April, 1995, pp. 44-46. (Applegate, 1995)

11. Bowman, F. M., Pilinis, C. and Seinfeld, J. H. Ozone and Aerosol Productivity of Reactive Organics. Atmospheric Environment, Volume 29, 1995, pp. 579-589. (Bowman *et al.*, 1994)

12. Finlayson-Pitts, B. J. and J. N. Pitts Jr. Chemistry of the Upper and Lower Atmosphere. Chapter 9, Academic Press, New York, 2000. (Finlayson-Pitts and Pitts, 2000)

13. Godish, Thad. Air Quality. Lewis Publishers, Inc., Chelsea, Michigan, 1991. (Godish, 1991)

14. Graedel, T. E., and Crutzen, Paul, J. Atmospheric Change: an Earth System Perspective. W. H. Freeman and Company, New York, 1993. (Graedel and Crutzen, 1993)

15. Griffin, R. J., Cocker III, D. R., and Seinfeld, J. H. Incremental Aerosol Reactivity: Application to Aromatic and Biogenic Hydrocarbons. Environmental Science & Technology, Volume 33, 1999, pp. 2403-2408. (Griffin *et al.*, 1999)

16. Grosjean, D. and J.H. Seinfeld. Parameterization of the Formation Potential of Secondary Organic Aerosols. Atmospheric Environment, Volume 23, 1989, pp. 1733-1747. (Grosjean and Seinfeld, 1989)

17. Grosjean, D. *In Situ* Organic Aerosol Formation during a Smog Episode: Estimated Production and Chemical Functionality. Atmospheric Environment, Volume 26A, 1992, pp. 953-963. (Grosjean, 1992)

18. Harner, T. and Bidleman, T. F. Octanol-air Partition Coefficient for Describing Particle/Gas Partitioning of Aromatic Compounds in Urban Air. Environmental Science & Technology, Volume 32, 1998, pp. 1494-1502. (Harner and Bidleman, 1998)

19. Johnson, C. E. and R. G. Derwent. Relative Radiative Forcing Consequences of Global Emissions of Hydrocarbons, Carbon Monoxide, and NOx from Human Activities Estimated with a Zonally-averaged Two-dimensional Model. Climatic Change, Volume 34, 1996, pp. 4439-4462. (Johnson and Derwent, 1996)

20. Kleindienst, T. E., Smith, D. F., Li, W., Edney, E. O., Driscoll, D. J., Speer, R. E., and Weathers, W. S. Secondary Organic Aerosol Formation from the Oxidation of Aromatic Hydrocarbons in the Presence of Dry Submicron Ammonium Sulfate Aerosol. Atmospheric Environment, Volume 33, 1999, pp. 3669-3681. (Kleindienst *et al.*, 1999)

21. McConnell, R., et al. Asthma in Exercising Children Exposed to Ozone: A Chort Study. Lancet, 2002, pp. 359:386-391. (McConnell *et al.*, 2002)

22. Moolgavkar, S. H. and Luebeck, E. G. A Critical Review of the Evidence on Particulate Air Pollution and Mortality. Epidemiology, Volume 7, 1996, pp. 420-428. (Moolgavkar and Luebeck, 1996)

23. Odum, J. R., T. Hoffmann, F. Bowman, D. Collins, R. C. Flagan, and J. H. Seinfeld. Gas/Particle Partitioning and Secondary Organic Aerosol Yields. Environmental Science & Technology, Volume 30, 1996, pp. 2580-2585. (Odum *et al.*, 1996)

24. Office of Environmental Health Hazard Assessment (OEHHA). All Acute Reference Exposure Levels Developed by the Office of Environmental Health Hazard Assessment as of May 2000. http://www.oehha.ca.gov/air/acute_rels/allAcRELs.html. (OEHHA, 2000)

25. Office of Environmental Health Hazard Assessment (OEHHA). All Chronic Reference Exposure Levels Adopted by OEHHA as of February 2005. http://www.oehha.ca.gov/air/chronic_rels/AllChrels.html. (OEHHA, 2005a)

26. Office of Environmental Health Hazard Assessment (OEHHA). Air Toxic Hot Spots Program Risk Assessment Guidelines, Part II, Technical Support Document for Describing Available Cancer Potency Factors. May, 2005. (OEHHA, 2005b)

27. Office of Environmental Health Hazard Assessment (OEHHA). State of California, Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Safe Drinking Water and Toxic Enforcement Act of 1986, Chemical Known To The State To Cause Cancer And Reproductive Toxicity. August, 2006. (OEHHA, 2006)

28. Pandis, S. N., R. A. Harley, G. R. Cass, and J. H. Seinfeld. Secondary Organic Aerosol Formation and Transport. Atmospheric Environment, Volume 26A, 1992, pp. 2269-2282. (*Pandis et al.*, 1992)

29. Pankow, J. F. An absorption model of gas/particle partitioning of organic compounds in the atmosphere. Atmospheric Environment, Volume 28, 1994, pp. 185-188. (Pankow, 1994a)

30. Pankow, J. F. An Absorption Model of the Gas/Aerosol Partitioning Involved in the Formation of Secondary Organic Aerosol. Atmospheric Environment, Volume 28, 1994, pp. 189-193. (Pankow, 1994b)

31. Seinfeld, J. H. and Pandis, S. N. Atmospheric Chemistry and Physics-from Air Pollution to Climate Change. John Wiley & Sons, Inc. 1998, pp. 1326. (Seinfeld and Pandis, 1998)

32. Schwartz, J., Dockery, D. W., and Neas, L. M. Is Daily Mortality Associated Specifically with Fine Particles. Journal of Air & Waste Management Association, Volume 46, 1996, pp. 927-939. (Schwartz *et al.*, 1996)

33. United States Environmental Protection Agency. In Brief: The U.S. Greenhouse Gas Inventory. EPA 430-F-02-008. Office of Air and Radiation (6204N), Washington, DC 20460. April, 2002. (U.S. EPA, 2002b)

34. United States Environmental Protection Agency. Environmental Indicators: Ozone Depletion. http://www.epa.gov/spdpublc/science/indicat/. (U.S. EPA, 2003)

35. Wallington, T. J., Schneider, W. F., Worsnop, D. R., Nielsen, O. J., Sehested, J., Debruyn, W. J., and Shorter, J. A. The Environmental Impact of CFC Replacements--HFCs and HCFCs. Environmental Science & Technology, Volume 28, 1994, pp. 320-326. (Wallington *et al.*, 1994)

36. Wang, S.C., R. C. Flagan, and J. H. Seinfeld. Aerosol Formation and Growth in Atmospheric Organic/NO_x Systems-I. Outdoor Smog Chamber Studies of C_7- and C_8-Hydrocarbons. Atmospheric Environment, Volume 26, 1992, pp. 403-420. (Wang *et al.*, 1992)

37. Wigley, T. M. L., S. J. Smith, and M. J. Prather. Radiative Forcing due to Reactive Gas Emissions. Journal of Climate, Volume 5, 2002, pp. 2690-2696. (Wigley *et al.,* 2002)

38. Yu, J., Cocker III, D. R., Griffin, R. J., Flagan, R. C., and Seinfeld, J. H. Gas-phase Ozone Oxidation of Monoterpenes: Gaseous and Particulate Products. Journal of Atmospheric Chemistry, Volume 34, 1999, pp. 207-258. (Yu *et al.*, 1999)

IX.

FUTURE ACTIVITIES

In this Chapter, we present future activities of the Board's consumer products program. Staff is scheduled to bring new consumer product limits to the Board in 2007. Staff also has committed to a survey in 2007 for the 2006 sales year, which will be used as the basis for a rulemaking in 2008. The 2007 8-hour ozone SIP will soon be developed, and it is expected that it will contain commitments for further reductions from consumer products in the next decade. For each of these future activities, staff will consult with interested parties through the same workgroup process (see Chapter II) that has been employed over the last fifteen years. Each of the activities listed above are described in detail below.

A. 2007 CONSUMER PRODUCTS REGULATION AMENDMENTS

The rulemaking scheduled for 2006 to obtain 10-15 tpd VOC reductions was broken into two parts. The first part is the rulemaking discussed in this staff report to be considered by the Board in November 2006. The remainder of the commitment will be considered in 2007. This bifurcation was proposed to address the concerns of industry representatives. Specifically, the representatives felt that with initial staff proposals to regulate over 50 product categories, there was not enough time for all technical issues to be thoroughly addressed and requested that the Board Hearing be postponed. In response to industry concerns, staff is bringing forth in November 2006 only those categories for which technical issues had been identified, discussed, and predominantly addressed. The remainder of the categories, for which technical issues remain, will be considered at the March 2007 Board Hearing.

B. 2006 CONSUMER AND COMMERCIAL PRODUCTS SURVEY

The 2006 Consumer and Commercial Products Survey (2006 Survey) will be conducted in 2007 and will cover product formulations and sales occurring in the 2006 calendar year. The 2006 Survey will predominantly cover those products that were not surveyed in the 2003 Survey. Products included will be those regulated categories with limits becoming effective in 2004 and 2005 and will include Aerosol Coating Products. Once again, the format of the survey should be similar to that of the 2001 and 2003 Surveys, and staff will form a workgroup of interested parties in the development of the survey.

C. 2008 CONSUMER PRODUCTS REGULATORY AMENDMENTS

Per the State Implementation Plan (SIP), (see discussion Chapter I), ARB must achieve an additional 10 - 20 tpd reductions statewide from consumer products by 2010. This rulemaking will focus on those categories not regulated in the 2006 or 2007 rulemakings. Staff anticipates looking at innovative approaches to achieve the reductions, including but not limited to alternative packaging, and zero and near zero

emission technologies. Staff will focus on achieving reductions through mass-based limits, but where feasible, will consider the setting of reactivity-based standards.

D. FURTHER REDUCTIONS FROM CONSUMER PRODUCTS

As was discussed in Chapter IV, in addition to the reduction strategies specified for each category, the SIP requires significant additional emission reductions from long-term strategies. These reductions will need to come from all categories including consumer products. Therefore, ARB staff is required to evaluate whether further reductions from Consumer Products other than those specified in the SIP from the CONS-2 measure can be obtained.

E. 2007 STATE IMPLEMENTATION PLAN – CONSUMER PRODUCTS EMISSIONS REDUCTION COMMITMENTS

In July 1997, U.S. EPA established a new federal 8-hour standard for ozone and fine particulate matter ($PM_{2.5}$). SIPs demonstrating attainment of the new federal ozone standard must be adopted by the local air districts and ARB, and submitted to U.S. EPA by June 15, 2007. Emission inventory updates, air quality modeling, and other work in support of the 2007 Ozone SIP has begun. ARB and local air districts are currently working on the SIP measures to show how we will meet new, stricter federal air quality standards for ozone. The preliminary draft of the State Strategy for Meeting Federal Air Quality Standards is scheduled to be released in the fall of 2006, and staff is currently holding workshops and soliciting comments. This planning document will commit ARB to further control the sources under its jurisdiction to the extent necessary to meet the standards and protect public health. The emission reduction targets in the preliminary State Strategy are challenging – significant reductions are needed from every major source category in order to meet our air quality goals in the most polluted areas of the State.

It is, therefore, expected that there will be a Consumer Products element of the 2007 SIP which will set forth a specific commitment that further emission reductions from Consumer Products will be needed.

The final draft of the State Strategy will be released in early 2007 and is set for Board consideration in the spring of 2007. The regional ozone attainment plans, which rely on emission reductions from State measures, will be heard by the Board from March to May 2007, and must be submitted to U.S. EPA by June 2007. The $PM_{2.5}$ SIP[1] must be adopted by the Board and submitted to U.S. EPA by April 2008. For the latest developments on the SIP, go to http://www.arb.ca.gov/planning/sip/sip.htm.

[1] On September 21, 2006, U.S. EPA announced a more stringent 24-hour PM standard. Final designations for the new standard are scheduled to be promulgated in 2009 (U.S.EPA, 2006).

REFERENCE

1. United States Environmental Protection Agency. "National Ambient Air Quality Standards for Particulate Matter." September 21, 2006. (U.S. EPA, 2006)

APPENDIX B:
Proposed Amendments to the Aerosol Coating Products Regulation and the Consumer Products Regulation

Proposed Regulation Order
REGULATION FOR REDUCING THE OZONE FORMED FROM AEROSOL COATING PRODUCT EMISSIONS

[Note: Proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions.]

Amend title 17, California Code of Regulation, Section 94523 as follows:

SUBCHAPTER 8.5 CONSUMER PRODUCTS

Article 3. Aerosol Coating Products

94523. Exemptions.

a) i) for products manufactured before December 31, 2008: This article shall not apply to aerosol lubricants, mold releases, automotive underbody coatings, electrical coatings, cleaners, belt dressings, anti-static sprays, layout fluids and removers, adhesives, maskants, rust converters, dyes, inks, cosmetics or any other products used on the human body, and leather preservatives or cleaners.

ii) for products manufactured on or after December 31, 2008: This article shall not apply to aerosol lubricants, mold releases, automotive underbody coatings, electrical coatings, cleaners, belt dressings, anti-static sprays, layout fluids and removers, adhesives, maskants, rust converters, dyes, inks, cosmetics or any other products used on the human body, leather preservatives or cleaners, "Rubber/Vinyl Protectants" as defined in section 94508, and "Fabric Protectants" as defined in section 94508.

(b) This article shall not apply to any aerosol coating product manufactured in California for shipment and use outside of California.

(c) The provisions of this article shall not apply to a manufacturer, distributor, or responsible party who sells, supplies, or offers for sale in California an aerosol coating product that does not comply with the limits specified in section 94522(a)(2) or (a)(3), as long as the manufacturer, distributor, or responsible party can demonstrate both that the aerosol coating product is intended for shipment and use outside of California, and that the manufacturer, distributor, or responsible party has taken reasonable prudent precautions to assure that the aerosol coating product is not distributed to California. This subsection (c) does not apply to aerosol coating products that are sold, supplied, or offered for sale by any person to retail outlets in California.

(d) The requirements in sections 94522(a)(2) and (a)(3) prohibiting the application of aerosol coating products that exceed the limits specified in the sections 94522(a)(2) or (a)(3) shall apply only to commercial application of aerosol coating

products.

NOTE: Authority cited: Section 39600, 39601, and 41712, Health and Safety Code.
Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

Proposed Regulation Order
REGULATION FOR REDUCING VOLATILE ORGANIC COMPOUND EMISSIONS FROM CONSUMER PRODUCTS

SUBCHAPTER 8.5 CONSUMER PRODUCTS

[Note: Proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to indicate deletions.]

Amend title 17, California Code of Regulation, sections 94508, 94509, 94510, 94511, 94512, 94513, 94514, 94515, 94516 and 94517 to read as follows:

Article 2. Consumer Products

94507. Applicability.

Except as provided in Sections 94509(i) and 94510, this article shall apply to any person who sells, supplies, offers for sale, or manufactures consumer products for use in the state of California.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

94508. Definitions.

(a) For the purpose of this article, the following definitions apply:

(1) "Adhesive" means any product that is used to bond one surface to another by attachment. "Adhesive" does not include products used on humans and animals, adhesive tape, contact paper, wallpaper, shelf liners, or any other product with an adhesive incorporated onto or in an inert substrate. For "Contact Adhesive," "Construction, Panel, and Floor Covering Adhesive," and "General Purpose Adhesive" only, "adhesive" also does not include units of product, less packaging, which weigh more than one pound and consist of more than 16 fluid ounces. This limitation does not apply to aerosol adhesives.

(2) "Adhesive Remover" means a product designed to remove adhesive from either a specific substrate or a variety of substrates. "Adhesive Removers" do not include products that remove adhesives intended for use on humans or animals.

For the purpose of this definition and "Adhesive Remover" subcategories (A-D), the term "adhesive" shall mean a substance used to bond one or more materials. Adhesive includes, but is not limited to: caulks; sealants; glues; or similar substances used for the purpose of forming a bond.

(A) "Floor or Wall Covering Adhesive Remover" means a product designed or labeled to remove floor or wall coverings and associated adhesive from the underlying substrate.

(B) "Gasket or Thread Locking Adhesive Remover" means a product designed or labeled to remove gaskets or thread locking adhesives. Products labeled for dual use as a paint stripper and gasket remover and/or thread locking adhesive remover are considered "Gasket or Thread Locking Adhesive Remover."

(C) "General Purpose Adhesive Remover" means a product designed or labeled to remove cyanoacrylate adhesives as well as non-reactive adhesives or residue from a variety of substrates. "General Purpose Adhesive Remover" includes, but is not limited to, products that remove thermoplastic adhesives; pressure sensitive adhesives; dextrine or starch-based adhesives; casein glues; rubber or latex-based adhesives; as well as products that remove stickers; decals; stencils; or similar materials. "General Purpose Adhesive Remover" does not include "Floor or Wall Covering Adhesive Remover."

(D) "Specialty Adhesive Remover" means a product designed to remove reactive adhesives from a variety of substrates. Reactive adhesives include adhesives that require a hardener or catalyst in order for the bond to occur. Examples of reactive adhesives include, but are not limited to: epoxies; urethanes; silicones. "Specialty Adhesive Remover" does not include "Gasket or Thread Locking Adhesive Remover."

(3) "Aerosol Adhesive" means any adhesive packaged as an aerosol product in which the spray mechanism is permanently housed in a nonrefillable can designed for hand-held application without the need for ancillary hoses or spray equipment. Aerosol adhesives include special purpose spray adhesives, mist spray adhesives, and web spray adhesives.

(4) "Aerosol Cooking Spray" means any aerosol product designed either to reduce sticking on cooking and baking surfaces or to be applied on food, or both.

(5) "Aerosol Product" means a pressurized spray system that dispenses product ingredients by means of a propellant contained in a product or a product's container, or by means of a mechanically induced force. "Aerosol Product" does not include "Pump Spray."

(6) "Agricultural Use" means the use of any pesticide or method or device for the control of pests in connection with the commercial production, storage or processing of any animal or plant crop. "Agricultural Use" does not include the sale or use of pesticides in properly labeled packages or containers which are

intended for: (A) Home use, (B) Use in structural pest control, or (C) Industrial or Institutional use. For the purposes of this definition only:

"Home use" means use in a household or its immediate environment.

"Structural pest control" means a use requiring a license under Chapter 14 (commencing with Section 8500), Division 3, of the Business and Professions Code.

"Industrial use" means use for or in a manufacturing, mining, or chemical process or use in the operation of factories, processing plants, and similar sites.

"Institutional use" means use within the confines of, or on property necessary for the operation of buildings such as hospitals, schools, libraries, auditoriums, and office complexes.

(7) "Air Freshener" means any consumer product including, but not limited to, sprays, wicks, powders, and crystals, designed for the purpose of masking odors, or freshening, cleaning, scenting, or deodorizing the air. "Air Freshener" includes dual purpose air freshener/disinfectant products. "Air Freshener" does not include products that are used on the human body, products that function primarily as cleaning products as indicated on a product label, or "Toilet/Urinal Care Product."

(8) "All Other Carbon-Containing Compounds" means all other compounds which contain at least one carbon atom and are not a "Table B" or a "LVP-VOC."

(9) "All Other Forms" means all consumer product forms for which no form-specific VOC standard is specified. Unless specified otherwise by the applicable VOC standard, "all other forms" include, but are not limited to, solids, liquids (which includes the liquid containing or liquid impregnated portion of the cloth or paper wipes (towelettes), wicks, powders, and crystals~~, and cloth or paper wipes (towelettes)~~.

(10) "Antimicrobial Hand or Body Cleaner or Soap" means a cleaner or soap which is designed to reduce the level of microorganisms on the skin through germicidal activity, and is regulated as an over-the-counter drug by the U.S. Food and Drug Administration. "Antimicrobial Hand or Body Cleaner or Soap" includes, but is not limited to, (A) antimicrobial hand or body washes/cleaners, (B) foodhandler hand washes, (C) healthcare personnel hand washes, (D) pre-operative skin preparations and (E) surgical scrubs. "Antimicrobial Hand or Body Cleaner or Soap" does not include prescription drug products, antiperspirants, "Astringent/Toner," deodorant, "Facial Cleaner or Soap," "General-use Hand or Body Cleaner or Soap," "Hand Dishwashing Detergent" (including antimicrobial),

"Heavy-duty Hand Cleaner or Soap," "Medicated Astringent/Medicated Toner," and "Rubbing Alcohol."

(11) "Anti-Static Product" means a product that is labeled to eliminate, prevent, or inhibit the accumulation of static electricity. "Anti-Static Product" does not include "Electronic Cleaner," "Floor Polish or Wax," "Floor Coating," and products that meet the definition of "Aerosol Coating Product" or "Architectural Coating."

(12) "Architectural Coating" means a coating applied to stationary structures and their appurtenances, to mobile homes, to pavements, or to curbs.

(13) "ASTM" means the American Society for Testing and Materials.

(14) "Astringent/Toner" means any product not regulated as a drug by the United States Food and Drug Administration (FDA) which is applied to the skin for the purpose of cleaning or tightening pores. This category also includes clarifiers and substrate-impregnated products. This category does not include any hand, face, or body cleaner or soap product, "Medicated Astringent/Medicated Toner," "Personal Fragrance Product," cold cream, lotion, or antiperspirant.

~~(15) "Automotive Brake Cleaner" means a cleaning product designed to remove oil, grease, brake fluid, brake pad material or dirt from motor vehicle brake mechanisms.~~

(15~~6~~) "Automotive Hard Paste Wax" means an automotive wax or polish which is: (A) designed to protect and improve the appearance of automotive paint surfaces; and (B) a solid at room temperature; and (C) contains 0% water by formulation.

(16~~7~~) "Automotive Instant Detailer" means a product designed for use in a pump spray that is applied to the painted surface of automobiles and wiped off prior to the product being allowed to dry.

(17~~8~~) "Automotive Rubbing or Polishing Compound" means a product designed primarily to remove oxidation, old paint, scratches or "swirl marks," and other defects from the painted surfaces of motor vehicles without leaving a protective barrier.

(18~~9~~) "Automotive Wax, Polish, Sealant or Glaze" means a product designed to seal out moisture, increase gloss, or otherwise enhance a motor vehicle's painted surfaces. "Automotive Wax, Polish, Sealant or Glaze" includes, but is not limited to, products designed for use in autobody repair shops and "drive-through" car washes, as well as products designed for the general public. "Automotive Wax, Polish, Sealant or Glaze" does not include "Automotive Rubbing or Polishing Compounds," automotive wash and wax products, surfactant-containing car

wash products, and products designed for use on unpainted surfaces such as bare metal, chrome, glass, or plastic.

(19~~20~~) "Automotive Windshield Washer Fluid (Dilutable)" means any liquid which meets the following criteria:

(A) the product is sold either in a container with a capacity of 55 gallons or more, or a container with a capacity of one quart or less; and
(B) the product is designed or labeled for use in a motor vehicle windshield washer fluid system either as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield(s).

"Automotive Windshield Washer Fluid (Dilutable)" does not include any fluid which is placed in a new motor vehicle at the time the vehicle is manufactured.

(20~~1~~) "Automotive Windshield Washer Fluid (Pre-Mixed)" means any liquid which meets the following criteria:

(A) the product is sold in a container with a capacity that is greater than one quart, but less than 55 gallons; and
(B) the product is designed or labeled for use in a motor vehicle windshield washer fluid system as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield(s).

"Automotive Windshield Washer Fluid (Pre-Mixed)" does not include any fluid which is placed in a new motor vehicle at the time the vehicle is manufactured.

(21~~2~~) "Bathroom and Tile Cleaner" means a product designed or labeled to clean tile or surfaces in bathrooms. "Bathroom and Tile Cleaner" does not include ~~products designed primarily to clean toilet bowls, toilet tanks, or urinals.~~ "Toilet/Urinal Care Product."

(22) "Brake Cleaner" means a cleaning product designed or labeled to remove oil, grease, brake fluid, brake pad material or dirt from motor vehicle brake mechanisms.

(23) "Bug and Tar Remover" means a product labeled to remove either or both of the following from painted motor vehicle surfaces without causing damage to the finish: (A) biological-type residues such as insect carcasses and tree sap and, (B) road grime, such as road tar, roadway paint markings, and asphalt.

(24) "California Sales" means the sales (net pounds of product, less packaging and container, per year) in California for either the calendar year immediately prior to the year that the information required by the Executive Officer pursuant to section 94513 (required information) is due or, if that data is not available, any consecutive 12 month period commencing no earlier than 2 years prior to the due

date of the required information. If direct sales data for California is not available, sales may be estimated by prorating national or regional sales data by population.

(25) "Carburetor or Fuel-Injection Air Intake Cleaners" means a product designed or labeled to remove fuel deposits, dirt, or other contaminants from a carburetor, choke, throttle body of a fuel-injection system, or associated linkages. "Carburetor or Ffuel-injection Aair Iintake Ceaners" does not include products designed or labeled exclusively to be introduced directly into the fuel lines or fuel storage tank prior to introduction into the carburetor or fuel injectors., or products designed or labeled exclusively to be introduced during engine operation directly into air intake vacuum lines by using a pressurized sprayer wand.

(26) "Carpet and Upholstery Cleaner" means a cleaning product designed for the purpose of eliminating dirt and stains on rugs, carpeting, and the interior of motor vehicles and/or on household furniture or objects upholstered or covered with fabrics such as wool, cotton, nylon or other synthetic fabrics. "Carpet and Upholstery Cleaner" includes, but is not limited to, products that make fabric protectant claims. "Carpet and Upholstery Cleaner" does not include "General Purpose Cleaners," "Spot Removers," vinyl or leather cleaners, dry cleaning fluids, or products designed exclusively for use at industrial facilities engaged in furniture or carpet manufacturing.

(27) "Charcoal Lighter Material" means any combustible material designed to be applied on, incorporated in, added to, or used with charcoal to enhance ignition. "Charcoal Lighter Material" does not include any of the following: (A) electrical starters and probes, (B) metallic cylinders using paper tinder, (C) natural gas, (D) propane, and (E) fat wood.

(28) "Colorant" means any pigment or coloring material used in a consumer product for an aesthetic effect, or to dramatize an ingredient.

(29) "Construction, Panel, and Floor Covering Adhesive" means any non-aerosol one-component adhesive that is designed or labeled ~~exclusively~~ for the installation, remodeling, maintenance, or repair of: (A) structural and building components that include, but are not limited to, beams, trusses, studs, paneling (drywall or drywall laminates, fiberglass reinforced plastic (FRP), plywood, particle board, insulation board, pre-decorated hardboard or tileboard, etc.), ceiling and acoustical tile, molding, fixtures, countertops or countertop laminates, cove or wall bases, and flooring or subflooring; or (B) floor or wall coverings that include, but are not limited to, wood or simulated wood covering, carpet, carpet pad or cushion, vinyl-backed carpet, flexible flooring material, nonresilient flooring material, mirror tiles and other types of tiles, and artificial grass. "Construction, Panel, and Floor Covering Adhesive" does not include "Floor Seam Sealer."

(30) "Consumer" means any person who seeks, purchases, or acquires any consumer product for personal, family, household, or institutional use. Persons acquiring a consumer product for resale are not "consumers" for that product.

(31) "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 article, the term "consumer product" shall also refer to aerosol adhesives, including aerosol adhesives used for consumer, industrial, and commercial uses.

(32) "Contact Adhesive" means ~~an~~ non-aerosol adhesive that: (A) is designed for application to both surfaces to be bonded together, and (B) is allowed to dry before the two surfaces are placed in contact with each other, and (C) forms an immediate bond that is impossible, or difficult, to reposition after both adhesive-coated surfaces are placed in contact with each other, and (D) does not need sustained pressure or clamping of surfaces after the adhesive-coated surfaces have been brought together using sufficient momentary pressure to establish full contact between both surfaces. "Contact Adhesive" does not include rubber cements that are primarily intended for use on paper substrates. "Contact Adhesive" also does not include vulcanizing fluids that are designed and labeled for tire repair only.

(33) "Contact Adhesive - General Purpose" means any contact adhesive that is not a "Contact Adhesive - Special Purpose."

(34) "Contact Adhesive - Special Purpose" means a contact adhesive that: (A) is used to bond melamine-covered board, unprimed metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber, high pressure laminate or wood veneer 1/16 inch or less in thickness to any porous or nonporous surface, and is sold in units of product, less packaging, that contain more than eight fluid ounces, or (B) is used in automotive applications that are (1.) automotive under-the-hood applications requiring heat, oil or gasoline resistance, or (2.) body-side molding, automotive weatherstrip or decorative trim.

(35) "Container/Packaging" means the part or parts of the consumer or institutional product which serve only to contain, enclose, incorporate, deliver, dispense, wrap or store the chemically formulated substance or mixture of substances which is solely responsible for accomplishing the purposes for which the product was designed or intended. "Container/Packaging" includes any article onto or into which the principal display panel and other accompanying literature or graphics are incorporated, etched, printed or attached.

(36) "Crawling Bug Insecticide" means any insecticide product that is designed for use against ants, cockroaches, or other household crawling arthropods, including, but not limited to, mites, silverfish or spiders. "Crawling Bug Insecticide" does not include products designed to be used exclusively on humans or animals, or any house dust mite product. For the purposes of this definition only:

"House dust mite product" means a product whose label, packaging, or accompanying literature states that the product is suitable for use against house dust mites, but does not indicate that the product is suitable for use against ants, cockroaches, or other household crawling arthropods.

"House dust mite" means mites which feed primarily on skin cells shed in the home by humans and pets and which belong to the phylum Arthropoda, the subphylum Chelicerata, the class Arachnida, the subclass Acari, the order Astigmata, and the family Pyroglyphidae.

(37) "Deodorant Body Spray" means:

(A) for products manufactured before January 1, 2006: a "Personal Fragrance Product" with 20 percent or less fragrance.

(B) for products manufactured on or after January 1, 2006: a "Personal Fragrance Product" with 20 percent or less fragrance, that is designed for application all over the human body to provide a scent. A "Deodorant Body Spray" product that indicates or depicts on the container or packaging, or on any sticker or label affixed thereto, that it can be used on or applied to the human axilla, is a "Deodorant" as defined in section 94501(d).

(38) "Device" means any instrument or contrivance (other than a firearm) which is designed for trapping, destroying, repelling, or mitigating any pest or any other form of plant or animal life (other than man and other than bacteria, virus, or other microorganism on or in living man or other living animals); but not including equipment used for the application of pesticides when sold separately therefrom.

(39) "Disinfectant" means any product ~~intended~~ labeled to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects and whose label is registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). "Disinfectant" does not include any of the following: (A) products ~~designed~~ labeled solely for use on human or animals, (B) products ~~designed~~ labeled solely for agricultural use, (C) products ~~designed~~ labeled solely for use in swimming pools, therapeutic tubs, or hot tubs, (D) products, which are (1) sold exclusively to medical or veterinary establishments, and (2) are labeled to be used on heat sensitive critical, or semi-critical medical devices, or medical equipment surfaces prior to high level disinfection, ~~as indicated on the principal display panel or label,~~

~~are designed labeled primarily for use as bathroom and tile cleaners, glass cleaners, general purpose cleaners, toilet bowl cleaners, or metal polishes~~ and (E) products, which are subject to a VOC standard under another regulated category in section 94509(a), as dictated by the primary use indicated on the principal display panel.

(40) "Distributor" means any person to whom a consumer product is sold or supplied for the purposes of resale or distribution in commerce, except that manufacturers, retailers, and consumers are not distributors.

(41) "Double Phase Aerosol Air Freshener" means an aerosol air freshener with the liquid contents in two or more distinct phases that requires the product container be shaken before use to mix the phases, producing an emulsion.

(42) "Dry Cleaning Fluid" means any non-aqueous liquid product designed and labeled exclusively for use on: (1) fabrics which are labeled "for dry clean only," such as clothing or drapery; or (2) "S-coded" fabrics. "Dry Cleaning Fluid" includes, but is not limited to, those products used by commercial dry cleaners and commercial businesses that clean fabrics such as draperies at the customer's residence or work place. "Dry Cleaning Fluid" does not include "Spot Remover" or "Carpet and Upholstery Cleaner." For the purposes of this definition, S-coded fabric means an upholstery fabric designed to be cleaned only with water-free spot cleaning products as specified by the Joint Industry Fabric Standards Committee."

(43) "Dual Purpose Air Freshener/Disinfectant" means an aerosol product that is represented on the product container for use as both a disinfectant and an air freshener, or is so represented on any sticker, label, packaging, or literature attached to the product container.

(44) "Dusting Aid" means a product designed to assist in removing dust and other soils from floors and other surfaces without leaving a wax or silicone based coating. "Dusting Aid" does not include "Pressurized Gas Duster."

(45) "Electrical Cleaner" means a product labeled to remove heavy soils such as grease, grime, or oil from electrical equipment, including, but not limited to, electric motors, armatures, relays, electric panels, or generators. Electrical Cleaner does not include "General Purpose Cleaner," "General Purpose Degreaser," "Dusting Aid," "Electronic Cleaner," "Energized Electrical Cleaner," "Pressurized Gas Duster," "Engine Degreaser," "Anti-Static Product," ~~or~~ products designed to clean the casings or housings of electrical equipment.

(46) "Electronic Cleaner" means a product labeled for the removal of dirt, moisture, dust, flux, or oxides from the internal components of electronic or precision equipment such as circuit boards, and the internal components of electronic devices, including but not limited to, radios, compact disc (CD) players, digital

video disc (DVD) players, and computers. Electronic Cleaner does not include "General Purpose Cleaner," "General Purpose Degreaser," "Dusting Aid," "Pressurized Gas Duster," "Engine Degreaser," "Electrical Cleaner," "Energized Electrical Cleaner," "Anti-Static Product," ~~or~~ products designed to clean the casings or housings of electronic equipment, or products that are (A) sold exclusively to establishments which manufacture or construct goods or commodities; and (B) labeled "not for retail sale."~~.~~

(47) "Energized Electrical Cleaner" means a product that meets both of the following criteria:

1) the product is labeled to clean and/or degrease electrical equipment, where cleaning and/or degreasing is accomplished when electrical current exists, or when there is a residual electrical potential from a component such as a capacitor;
2) the product label clearly displays the statements: "Energized Equipment use only. Not to be used for motorized vehicle maintenance, or their parts."

"Energized Electrical Cleaner" does not include "Electronic Cleaner."

(48) "Engine Degreaser" means a cleaning product designed or labeled to remove grease, grime, oil and other contaminants from the external surfaces of engines and other mechanical parts.

(49) "Executive Officer" means the Executive Officer of the Air Resources Board, or his or her delegate.

(50) "Existing Product" means any formulation of the same product category and form sold, supplied, manufactured, or offered for sale in California prior to the following dates, or any subsequently introduced identical formulation:

(A) October 21, 1991, for all products listed in section 94509(a) that have initial effective dates of January 1, 1993, or January 1, 1994;

(B) January 6, 1993, for all products listed in section 94509(a) that have initial effective dates of January 1, 1995, or January 1, 1997, and charcoal lighter materials subject to section 94509(h);

(C) August 16~~8~~, 1998, for all products listed in section 94509(a) that have initial effective dates of January 1, 2001, January 1, 2002, January 1, 2003, or January 1, 2005;

(D) ~~the operative date~~ November 19, 2000 ~~of the "Mid-term Measures II" amendments (i.e. 30 days after the "Mid-term Measures II" rulemaking action is approved by the Office of Administrative Law)~~, for all products in the following product categories listed in section 94509(a): "Non-aerosol

General Purpose Degreaser," "Sealant and Caulking Compound," and "Tire Sealant and Inflator."

(E) July 20, 2005, for all products listed in section 94509(a) that have an effective date of December 31, 2006, December 31, 2008, or December 31, 2009; and

(F) the effective date of the "2006 Amendments" (i.e., 30 days after the "2006 Amendments" rulemaking action is approved by the Office of Administrative Law), for all products listed in section 94509(a) that have an initial effective date of December 31, 2008, or December 31, 2010.

(51) "Fabric Protectant" means:

(A) for products manufactured before December 31, 2008: a product designed to be applied to fabric substrates to protect the surface from soiling from dirt and other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include waterproofers, products designed for use solely on leather, or products designed for use solely on fabrics which are labeled "for dry clean only" and sold in containers of 10 fluid ounces or less.

(B) for products manufactured on or after December 31, 2008: a product designed or labeled to be applied to fabric substrates to protect the surface from soiling from dirt or other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include waterproofers, or products designed for use solely on leather. Fabric Protectant" does not include pigmented products used primarily for coloring, translucent-film-forming products used in conjunction with pigmented products, and other film forming products used for construction, reconstruction, modification, structural maintenance or repair of fabric substrates, or products qualifying as Vinyl/Fabric/Leather/Polycarbonate Coating under section 94521(a).

(52) "Fabric Refresher" means a product labeled to neutralize or eliminate odors on non-laundered fabric including, but not limited to, soft household surfaces, rugs, carpeting, draperies, bedding, automotive interiors, footwear, athletic equipment, clothing and/or on household furniture or objects upholstered or covered with fabrics such as, but not limited to, wool, cotton, or nylon. "Fabric Refresher" does not include "Anti-static Product," "Carpet and Upholstery Cleaner," soft household surface sanitizers, "Footwear or Leather Care Product," "Spot Remover," or "Disinfectant," or products labeled for application to both fabric and human skin.

For the purposes of this definition only, "soft household surface sanitizer" means a product labeled to neutralize or eliminate odors on surfaces listed

above whose label is registered as a sanitizer under the Federal Insecticide, Fungicide, and Rodenticide Act, (FIFRA, 7 U.S.C. 136 et seq.).

(53) "Facial Cleaner or Soap" means a cleaner or soap designed primarily to clean the face. "Facial Cleaner or Soap" includes, but is not limited to, facial cleansing creams, semisolids, liquids, lotions, and substrate-impregnated forms. "Facial Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap," "Astringent/Toner," "General-use Hand or Body Cleaner or Soap," "Medicated Astringent/Medicated Toner," or "Rubbing Alcohol."

(54) "Fat Wood" means pieces of wood kindling with high naturally-occurring levels of sap or resin which enhance ignition of the kindling. "Fat wood" does not include any kindling with substances added to enhance flammability, such as wax-covered or wax-impregnated wood-based products.

(55) "Flea and Tick Insecticide" means any insecticide product that is designed for use against fleas, ticks, their larvae, or their eggs. "Flea and Tick Insecticide" does not include products that are designed to be used exclusively on humans or animals and their bedding.

~~(56) "Flexible Flooring Material" means asphalt, cork, linoleum, no-wax, rubber, seamless vinyl and vinyl composite flooring.~~

(56~~7~~) "Floor Coating" means an opaque coating that is labeled and designed for application to flooring, including but not limited to, decks, porches, steps, and other horizontal surfaces which may be subject to foot traffic.

(57~~8~~) "Floor Polish or Wax" means a ~~wax, polish, or any other~~ product designed or labeled to polish, wax, condition, protect, temporarily seal, or otherwise enhance floor surfaces by leaving a protective ~~coating~~ finish that is designed or labeled to be periodically replenished. "Floor Polish or Wax" does not include "spray buff products," ~~products designed solely for the purpose of cleaning floors,~~ "~~f~~Floor ~~finish~~ Wax ~~s~~Strippers," products designed or labeled for unfinished wood floors, ~~and~~ or coatings subject to architectural coatings regulations.

"Floor Polish or Wax" is divided into three subcategories: products for resilient flooring materials, products for nonresilient flooring materials and wood floor wax. For the purposes of this article:

(A) "Resilient Flooring Material" means flexible flooring material includes but is not limited to asphalt, cork, linoleum, no-wax, rubber, seamless vinyl, and vinyl composite flooring.

(B) "Nonresilient Flooring Material" means flooring of a mineral content which is not flexible. "Nonresilient Flooring material" includes but is not limited to terrazzo, marble, slate, granite, brick, stone, ceramic tile, and concrete.

(C) "Wood Floor Wax" means wax-based products for use solely on wood floors.

(589) "Floor Seam Sealer" means any product designed and labeled exclusively for bonding, fusing, or sealing (coating) seams between adjoining rolls of installed flexible sheet flooring.

(5960) "Floor Wax Stripper" means a product designed to remove natural or synthetic floor polishes or waxes through breakdown of the polish or wax polymers, or by dissolving or emulsifying the polish or wax. "Floor Wax Stripper" does not include aerosol floor wax strippers or products designed to remove floor wax solely through abrasion.

(601) "Flying Bug Insecticide" means any insecticide product that is designed for use against flying insects or other flying arthropods, including but not limited to flies, mosquitoes, moths, or gnats. "Flying Bug Insecticide" does not include "wasp and hornet insecticide," products that are designed to be used exclusively on humans or animals, or any moth-proofing product. For the purposes of this definition only, "moth-proofing product" means a product whose label, packaging, or accompanying literature indicates that the product is designed to protect fabrics from damage by moths, but does not indicate that the product is suitable for use against flying insects or other flying arthropods.

(612) "Footwear or Leather Care Product" means any product designed or labeled to be applied to footwear or to other leather articles/components, to maintain, enhance, clean, protect, or modify the appearance, durability, fit, or flexibility of the footwear or leather article/component. Footwear includes both leather and non-leather foot apparel. "Footwear or Leather Care Product" does not include "Fabric Protectant," "General Purpose Adhesive," "Contact Adhesive," "Vinyl/Fabric/Leather/Polycarbonate Coating," as defined in section 94521(a), "Rubber/ and Vinyl Protectant," "Fabric Refresher," products solely for deodorizing, or sealant products with adhesive properties used to create external protective layers greater than 2 millimeters thick.

(623) "Fragrance" means a substance or complex mixture of aroma chemicals, natural essential oils, and other functional components with a combined vapor pressure not in excess of 2 mm of Hg at 20°C, the sole purpose of which is to impart an odor or scent, or to counteract a malodor.

(634) "Furniture Maintenance Product" means a wax, polish, conditioner, or any other product ~~designed~~ labeled for the purpose of polishing, protecting or enhancing finished wood surfaces other than floors and other furniture surfaces including but not limited to acrylics, ceramic, plastics, stone surfaces, metal surfaces, and fiberglass. "Furniture Maintenance Product" does not include "Dusting Aids," "Wood Cleaners," and products designed solely for the purpose of cleaning, ~~and~~

or products designed to leave a permanent finish such as stains, sanding sealers and lacquers.

(645) "Furniture Coating" means any paint designed for application to room furnishings including, but not limited to, cabinets (kitchen, bath and vanity), tables, chairs, beds, and sofas.

(656) "Gel" means a colloid in which the disperse phase has combined with the continuous phase to produce a semisolid material, such as jelly.

(667) "General Purpose Adhesive" means any non-aerosol adhesive designed for use on a variety of substrates. "General Purpose Adhesive" does not include (A) contact adhesives, (B) construction, panel, and floor covering adhesives, (C) adhesives designed exclusively for application on one specific category of substrates (i.e., substrates that are composed of similar materials, such as different types of metals, paper products, ceramics, plastics, rubbers, or vinyls), or (D) adhesives designed exclusively for use on one specific category of articles (i.e., articles that may be composed of different materials but perform a specific function, such as gaskets, automotive trim, weather-stripping, or carpets).

(678) "General Purpose Cleaner" means a general purpose cleaning product ~~designed~~ labeled for use on a variety of hard surfaces, including small appliances. ~~general all-purpose cleaning, in contrast to cleaning products designed to clean specific substrates in certain situations.~~ "General Purpose Cleaner" includes, but is not limited to, products designed or labeled for general floor cleaning, kitchen, ~~or~~ countertop, or sink cleaning, and cleaners designed or labeled to be used on a variety of hard surfaces such as stovetops, cooktops, or microwaves.

(689) "General Purpose Degreaser" means any product labeled to remove or dissolve grease, grime, oil and other oil-based contaminants from a variety of substrates, including automotive or miscellaneous metallic parts. "General Purpose Degreaser" does not include "Engine Degreaser," "General Purpose Cleaner," "Adhesive Remover," "Electronic Cleaner," "Electrical Cleaner," "Energized Electrical Cleaner," "Metal Polish/Cleanser," products used exclusively in "solvent cleaning tanks or related equipment," or products that are (A) sold exclusively to establishments which manufacture or construct goods or commodities; and (B) labeled "not for retail sale." "Solvent cleaning tanks or related equipment" includes, but is not limited to, cold cleaners, vapor degreasers, conveyorized degreasers, film cleaning machines, or products designed to clean miscellaneous metallic parts by immersion in a container.

(6970) "General-use Hand or Body Cleaner or Soap" means a cleaner or soap designed to be used routinely on the skin to clean or remove typical or common dirt and soils. "General-use Hand or Body Cleaner or Soap" includes, but is not limited to, hand or body washes, dual-purpose shampoo-body cleaners, shower or bath gels, and moisturizing cleaners or soaps. "General-use Hand or Body Cleaner or

Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap," "Astringent/Toner," "Facial Cleaner or Soap," "Hand Dishwashing Detergent" (including antimicrobial), "Heavy-duty Hand Cleaner or Soap," "Medicated Astringent/Medicated Toner," or "Rubbing Alcohol."

(70~~1~~) "Glass Cleaner" means a cleaning product designed primarily for cleaning surfaces made of glass. Glass cleaner does not include products designed solely for the purpose of cleaning optical materials used in eyeglasses, photographic equipment, scientific equipment and photocopying machines.

(71~~2~~) "Graffiti Remover" means a product labeled to remove spray paint, ink, marker, crayon, lipstick, nail polish, or shoe polish, from a variety of non-cloth or non-fabric substrates. "Graffiti Remover" does not include "Paint Remover or Stripper," "Nail Polish Remover," or "Spot Remover." Products labeled for dual use as both a paint stripper and graffiti remover are considered "Graffiti Removers."

(72~~3~~) "Hair Mousse" means a hairstyling foam designed to facilitate styling of a coiffure and provide limited holding power.

(73~~4~~) "Hair Shine" means any product designed for the primary purpose of creating a shine when applied to the hair. "Hair Shine" includes, but is not limited to, dual-use products designed primarily to impart a sheen to the hair. "Hair Shine" does not include "Hair Spray," "Hair Mousse," "Hair Styling Product," "Hair Styling Gel," or products whose primary purpose is to condition or hold the hair.

(74~~5~~) "Hair Styling Gel" means a consumer product manufactured before December 31, 2006, that is a high viscosity, often gelatinous, product that contains a resin and is designed for the application to hair to aid in styling and sculpting of the hair coiffure.

(75~~6~~) "Hair Spray" means:

(A) for products manufactured before December 31, 2006: a consumer product designed primarily for the purpose of dispensing droplets of a resin on and into a hair coiffure which will impart sufficient rigidity to the coiffure to establish or retain the style for a period of time, and

(B) for products manufactured on or after December 31, 2006: a consumer product that is applied to styled hair, and is designed or labeled to provide sufficient rigidity, to hold, retain and/or (finish) the style of the hair for a period of time. "Hair Spray" includes aerosol hair sprays, pump hair sprays, spray waxes; color, glitter, or sparkle hairsprays that make finishing claims; and products that are both a styling and finishing product. "Hair Spray" does not include spray products that are intended to aid in styling but does not provide finishing of a hairstyle.

For the purposes of this subchapter, "finish" or "finishing" means the maintaining and/or holding of previously styled hair for a period of time.

For the purposes of this subchapter, "styling" means the forming, sculpting, or manipulating the hair to temporarily alter the hair's shape.

(76~~7~~) "Hair Styling Product" means a consumer product manufactured on or after December 31, 2006, that is designed or labeled for the application to wet, damp or dry hair to aid in defining, shaping, lifting, styling and/or sculpting of the hair. "Hair Styling Product" includes, but is not limited to hair balm, clay, cream, creme, curl straightener, gel, liquid, lotion, paste, pomade, putty, root lifter, serum, spray gel, stick, temporary hair straightener, wax, spray products that aid in styling but do not provide finishing of a hairstyle, and leave-in volumizers, detanglers and/or conditioners that make styling claims. "Hair Styling Product" does not include "Hair Mousse," "Hair Shine," "Hair Spray," or shampoos and/or conditioners that are rinsed from the hair prior to styling.

For the purposes of this subchapter, "finish" or "finishing" means the maintaining and/or holding of previously styled hair for a period of time.

For the purposes of this subchapter, "styling" means the forming, sculpting, or manipulating the hair to temporarily alter the hair's shape.

(77~~8~~) "Heavy-Duty Hand Cleaner or Soap" means a product designed to clean or remove difficult dirt and soils such as oil, grease, grime, tar, shellac, putty, printer's ink, paint, graphite, cement, carbon, asphalt, or adhesives from the hand with or without the use of water. "Heavy-duty Hand Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap," "Astringent/Toner," "Facial Cleaner or Soap," "General-use Hand or Body Cleaner or Soap," "Medicated Astringent/Medicated Toner" or "Rubbing Alcohol."

(78~~9~~) "Herbicide" means a pesticide product designed to kill or retard a plant's growth, but excludes products that are: (A) for agricultural use, or (B) restricted materials that require a permit for use and possession.

(79~~80~~) "Household Product" means any consumer product that is primarily designed to be used inside or outside of living quarters or residences that are occupied or intended for occupation by individuals, including the immediate surroundings.

(80~~1~~) "Insect Repellent" means a pesticide product that is designed to be applied on human skin, hair or attire worn on humans in order to prevent contact with or repel biting insects or arthropods.

(81~~2~~) "Insecticide" means a pesticide product that is designed for use against insects or other arthropods, but excluding products that are: (A) for agricultural use, or (B) for a use which requires a structural pest control license under Chapter 14

(commencing with Section 8500) of the Business and Professions Code, or (C) restricted materials that require a permit for use and possession.

(8~~2~~3) "Insecticide Fogger" means any insecticide product designed to release all or most of its content, as a fog or mist, into indoor areas during a single application.

(8~~3~~4) "Institutional Product" or "Industrial and Institutional (I&I) Product" means a consumer product that is designed for use in the maintenance or operation of an establishment that: (A) manufactures, transports, or sells goods or commodities, or provides services for profit; or (B) is engaged in the nonprofit promotion of a particular public, educational, or charitable cause. "Establishments" include, but are not limited to, government agencies, factories, schools, hospitals, sanitariums, prisons, restaurants, hotels, stores, automobile service and parts centers, health clubs, theaters, or transportation companies. "Institutional Product" does not include household products and products that are incorporated into or used exclusively in the manufacture or construction of the goods or commodities at the site of the establishment.

(8~~4~~5) "Label" means any written, printed, or graphic matter affixed to, applied to, attached to, blown into, formed, molded into, embossed on, or appearing upon any consumer product or consumer product package, for purposes of branding, identifying, or giving information with respect to the product or to the contents of the package.

(8~~5~~6) "Laundry Prewash" means a product that is designed for application to a fabric prior to laundering and that supplements and contributes to the effectiveness of laundry detergents and/or provides specialized performance.

(8~~6~~7) "Laundry Starch/Sizing/Fabric Finish Product" means a product that is ~~designed~~ labeled for application to a fabric, either during or after laundering, to impart and prolong a crisp, fresh look and may also act to help ease ironing of the fabric. "Laundry Starch/Sizing/Fabric Finish Product" includes, but is not limited to, starch, sizing, and fabric finish. ~~, sizing, and starch.~~

(8~~7~~8) "Lawn and Garden Insecticide" means an insecticide product labeled primarily to be used in household lawn and garden areas to protect plants from insects or other arthropods. Notwithstanding the requirements of section 94512(a) aerosol "Lawn and Garden Insecticides" may claim to kill insects or other arthropods.

(8~~8~~9) "Liquid" means a substance or mixture of substances which is capable of a visually detectable flow as determined under ASTM D-4359-90. "Liquid" does not include powders or other materials that are composed entirely of solid particles.

(89~~9~~0) "Lubricant" means a product designed to reduce friction, heat, noise, or wear between moving parts, or to loosen rusted or immovable parts or mechanisms.

"Lubricant" does not include automotive power steering fluids; products for use inside power generating motors, engines, and turbines, and their associated power-transfer gearboxes; two cycle oils or other products designed to be added to fuels; products for use on the human body or animals or products that are (1) sold exclusively to establishments which manufacture or construct goods or commodities, and (2) labeled "not for retail sale."

(90~~4~~) "LVP-VOC" means a chemical "compound" or "mixture" that contains at least one carbon atom and meets one of the following:

(A) has a vapor pressure less than 0.1 mm Hg at 20°C, as determined by ARB Method 310; or
(B) is a chemical "compound" with more than 12 carbon atoms, or a chemical "mixture" comprised solely of "compounds" with more than 12 carbon atoms, as verified by formulation data, and the vapor pressure and boiling point are unknown; or
(C) is a chemical "compound" with a boiling point greater than 216°C, as determined by ARB Method 310; or
(D) is the weight percent of a chemical "mixture" that boils above 216°C, as determined by ARB Method 310.

For the purposes of the definition of LVP-VOC, chemical "compound" means a molecule of definite chemical formula and isomeric structure, and chemical "mixture" means a ~~substrate~~ substance comprised of two or more chemical "compounds."

(91~~2~~) "Manufacturer" means any person who imports, manufactures, assembles, produces, packages, repackages, or relabels a consumer product.

(92~~3~~) "Medicated Astringent/Medicated Toner" means any product regulated as a drug by the Food and Drug Administration (FDA) which is applied to the skin for the purpose of cleaning or tightening pores. "Medicated Astringent/Medicated Toner" includes, but is not limited to, clarifiers and substrate-impregnated products. "Medicated Astringent/Medicated Toner" does not include hand, face, or body cleaner or soap products, "Personal Fragrance Products," "Astringent/Toner," cold cream, lotion, antiperspirants, or products that must be purchased with a doctor's prescription.

(93~~4~~) "Metal Polish/Cleanser" means any product designed primarily to improve the appearance of finished metal, metallic, or metallized surfaces by physical or chemical action. To "improve the appearance" means to remove or reduce stains, impurities, or oxidation from surfaces or to make surfaces smooth and shiny. "Metal Polish/Cleanser" includes, but is not limited to, metal polishes used on brass, silver, chrome, copper, stainless steel and other ornamental metals. "Metal Polish/Cleanser" does not include "Automotive Wax, Polish, Sealant or Glaze," wheel cleaner, "Paint Remover or Stripper," products designed and

labeled exclusively for automotive and marine detailing, or products designed for use in degreasing tanks.

(9~~4~~5) "Mist Sspray Aadhesive" means any aerosol adhesive which is not a "Sspecial Ppurpose Sspray Aadhesive" and which delivers a particle or mist spray, resulting in the formation of fine, discrete particles that yield a generally uniform and smooth application of adhesive to the substrate.

(9~~5~~6) "Multi-purpose Dry Lubricant" means any lubricant which is: (A) designed and labeled to provide lubricity by depositing a thin film of graphite, molybdenum disulfide ("moly"), or polytetrafluoroethylene or closely related fluoropolymer ("teflon") on surfaces, and (B) designed for general purpose lubrication, or for use in a wide variety of applications.

(9~~6~~7) "Multi-purpose Lubricant" means any lubricant designed for general purpose lubrication, or for use in a wide variety of applications. "Multi-purpose Lubricant" does not include "Multi-purpose Dry Lubricants," "Penetrants," or "Silicone-based Multi-purpose Lubricants."

(9~~7~~8) "Multi-purpose Solvent" means any ~~organic~~ liquid product designed to be used for ~~a variety of purposes, including cleaning or degreasing of a variety of substrates, or thinning or~~ dispersing or dissolving or removing contaminants or other organic materials. "Multi-purpose Solvent" includes (A) products that do not display specific use instructions on the product container or packaging, (B) products that do not specify an end-use function or application on the product container or packaging, and (C) solvents used in institutional facilities, except laboratory reagents used in analytical, educational, research, scientific, or other laboratories. "Multi-purpose Solvent" does not include solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines, or solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment. "Multi-purpose Solvent" also does not include any product making any representation that the product may be used as, or is suitable for use as a consumer product which qualifies under a definition in section 94508; such products are not Multi-purpose solvents and are subject to the "Most Restrictive Limit" provision of section 94512.

(9~~8~~9) "Nail Polish" means any clear or colored coating designed for application to the fingernails or toenails and including but not limited to, lacquers, enamels, acrylics, base coats and top coats.

(99~~100~~)"Nail Polish Remover" means a product designed to remove nail polish and coatings from fingernails or toenails.

(10~~0~~1)"Non-Carbon Containing Compound" means any compound which does not contain any carbon atoms.

~~(102) "Nonresilient Flooring" means flooring of a mineral content which is not flexible. "Nonresilient Flooring" includes terrazzo, marble, slate, granite, brick, stone, ceramic tile and concrete.~~

(101~~3~~) "Non-Selective Terrestrial Herbicide" means a terrestrial herbicide product that is toxic to plants without regard to species.

(102~~4~~) "Oven Cleaner" means any cleaning product designed or labeled to clean and to remove dried or baked on food deposits from oven walls.

(103~~5~~) "Paint" means any pigmented liquid, liquefiable, or mastic composition designed for application to a substrate in a thin layer which is converted to an opaque solid film after application and is used for protection, decoration or identification, or to serve some functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics.

(104~~6~~) "Paint Remover or Stripper" means any product designed to strip or remove paints or other related coatings, by chemical action, from a substrate without markedly affecting the substrate. "Paint Remover or Stripper" does not include "Multi-purpose Solvents," ~~,~~ paint brush cleaners, products designed and labeled exclusively as "Graffiti Removers," and hand cleaner products that claim to remove paints and other related coatings from skin.

(105~~7~~) "Paint Thinner" means any ~~volatile~~ liquid product used for reducing the viscosity of coating compositions or components, that prominently displays the term "Paint Thinner," "Lacquer Thinner," "Thinner," or "Reducer" on the front panel of its packaging.

(106~~8~~) "Penetrant" means a lubricant designed and labeled primarily to loosen metal parts that have bonded together due to rusting, oxidation, or other causes. "Penetrant" does not include "Multi-purpose Lubricants" that claim to have penetrating qualities, but are not labeled primarily to loosen bonded parts.

(107~~9~~) "Person" shall have the same meaning as defined in Health and Safety Code Section 39047.

(108~~10~~) "Personal Fragrance Product" means any product which is applied to the human body or clothing for the primary purpose of adding a scent or masking a malodor, including cologne, perfume, aftershave, and toilet water. "Personal Fragrance Product" does not include: (A) Deodorant, as defined in section 94501(d); (B) medicated products designed primarily to alleviate fungal or bacterial growth on feet or other areas of the body; (C) mouthwashes, breath fresheners and deodorizers; (D) lotions, moisturizers, powders or other skin care products used primarily to alleviate skin conditions such as dryness and irritations; (E) products designed exclusively for use on human genitalia; (F) soaps, shampoos, and

products primarily used to clean the human body; and (G) fragrance products designed to be used exclusively on non-human animals.

(10911)"Pesticide" means and includes any substance or mixture of substances labeled, designed, or intended for use in preventing, destroying, repelling or mitigating any pest, or any substance or mixture of substances labeled, designed, or intended for use as a defoliant, desiccant, or plant regulator, provided that the term "pesticide" will not include any substance, mixture of substances, or device which the United States Environmental Protection Agency does not consider to be a pesticide.

(1102)"Pressurized Gas Duster" means a pressurized product labeled to remove dust from a surface solely by means of mass air or gas flow, including surfaces such as photographs, photographic film negatives, computer keyboards, and other types of surfaces that cannot be cleaned with solvents. "Pressurized Gas Duster" does not include "Dusting Aid."

(1113)"Principal Display Panel or Panels" means that part, or those parts of a label that are so designed as to most likely be displayed, presented, shown or examined under normal and customary conditions of display or purchase. Whenever a principal display panel appears more than once, all requirements pertaining to the "principal display panel" shall pertain to all such "principal display panels."

(1124)"Product Brand Name" means the name of the product exactly as it appears on the principal display panel of the product.

(1135)"Product Category" means the applicable category which best describes the product as listed in this Section 94508.

(1146)"Product Form," for the purpose of complying with Section 94513 only, means the applicable form which most accurately describes the product's dispensing form as follows:

A = Aerosol Product
S = Solid
P = Pump Spray
L = Liquid
SS = Semisolid
O = Other

(1157)"Propellant" means a liquefied or compressed gas that is used in whole or in part, such as a cosolvent, to expel a liquid or any other material from the same self-pressurized container or from a separate container.

(1168)"Pump Spray" means a packaging system in which the product ingredients within the container are not under pressure and in which the product is expelled only while a pumping action is applied to a button, trigger or other actuator.

(11~~7~~9) "Responsible Party" means the company, firm or establishment which is listed on the product's label. If the label lists two companies, firms or establishments, the responsible party is the party which the product was "manufactured for" or "distributed by," as noted on the label.

(11~~8~~20) "Restricted Materials" means pesticides established as restricted materials under Title 3, California Code of Regulations, section 6400.

(11~~9~~21) "Retailer" means any person who sells, supplies, or offers consumer products for sale directly to consumers.

(12~~0~~2) "Retail Outlet" means any establishment at which consumer products are sold, supplied, or offered for sale directly to consumers.

(12~~1~~3) "Rubber ~~and~~/Vinyl Protectant" means:

(A) for products manufactured before December 31, 2008: any product designed to protect, preserve or renew vinyl, rubber, and plastic on vehicles, tires, luggage, furniture, and household products such as vinyl covers, clothing, and accessories. "Rubber ~~and~~/Vinyl Protectant" does not include products primarily designed to clean the wheel rim, such as aluminum or magnesium wheel cleaners, and tire cleaners that do not leave an appearance-enhancing or protective substance on the tire.

(B) for products manufactured on or after December 31, 2008: any product designed or labeled to protect, preserve or renew vinyl, or rubber on vehicles, tires, luggage, furniture, and/or household products such as vinyl covers, clothing, or accessories. "Rubber/Vinyl Protectant" does not include: products primarily labeled to clean the wheel rim, such as aluminum or magnesium wheel cleaners; tire cleaners that do not leave an appearance-enhancing or protective substance on the tire; pigmented products used primarily for coloring; translucent-film-forming products used in conjunction with pigmented products; and other film-forming products used for construction, reconstruction, modification, structural maintenance or repair of rubber or vinyl substrates, or products qualifying as Vinyl/Fabric/Leather/Polycarbonate Coating under section 94521(a).

(12~~2~~4) "Rubbing Alcohol" means any product containing isopropyl alcohol (also called isopropanol) or denatured ethanol and labeled for topical use, usually to decrease germs in minor cuts and scrapes, to relieve minor muscle aches, as a rubefacient, and for massage.

(123) "Sanitizer" means any product that is registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA; 7 U.S.C. section 136 et seq.) and is labeled to reduce, but not necessarily eliminate, microorganisms in the air, on

surfaces, or on inanimate objects. "Sanitizer" includes food contact and non-food contact products. "Sanitizer" does not include (A) "Disinfectant," (B) products labeled solely for use on humans or animals, (C) products labeled solely for agricultural use, (D) products, which are subject to a VOC standard under another regulated category in section 94509(a), as dictated by the primary use indicated on the principal display panel.

(12~~45~~) "Sealant and Caulking Compound" means any product with adhesive properties that is designed to fill, seal, waterproof, or weatherproof gaps or joints between two surfaces. "Sealant and Caulking Compound" does not include roof cements and roof sealants; insulating foams; removable caulking compounds; clear/paintable/water resistant caulking compounds; floor seam sealers; products designed exclusively for automotive uses; or sealers that are applied as continuous coatings. "Sealant and Caulking Compound" also does not include units of product, less packaging, which weigh more than one pound and consist of more than 16 fluid ounces. For the purposes of this definition only, "removable caulking compounds" means a compound which temporarily seals windows or doors for three to six month time intervals, and "clear/paintable/water resistant caulking compounds" means a compound which contains no appreciable level of opaque fillers or pigments; transmits most or all visible light through the caulk when cured; is paintable; and is immediately resistant to precipitation upon application.

(12~~56~~) "Semisolid" means a product that, at room temperature, will not pour, but will spread or deform easily, including but not limited to gels, pastes, and greases.

(12~~67~~) "Shaving Cream" means an aerosol product which dispenses a foam lather intended to be used with a blade or cartridge razor, or other wet-shaving system, in the removal of facial or other bodily hair. "Shaving Cream" does not include "Shaving Gel."

(12~~78~~) "Shaving Gel" means an aerosol product which dispenses a post-foaming semi-solid designed to be used with a blade, cartridge razor, or other shaving system in the removal of facial or other bodily hair. "Shaving Gel" does not include "Shaving Cream."

(12~~89~~) "Silicone-based Multi-purpose Lubricant" means any lubricant which is: (A) designed and labeled to provide lubricity primarily through the use of silicone compounds including, but not limited to, polydimethylsiloxane, and (B) designed and labeled for general purpose lubrication, or for use in a wide variety of applications. "Silicone-based Multi-purpose Lubricant" does not include products designed and labeled exclusively to release manufactured products from molds.

(129~~30~~) "Single Phase Aerosol Air Freshener" means an aerosol air freshener with the liquid contents in a single homogeneous phase and which does not require that the product container be shaken before use.

(130~~1~~) "Solid" means a substance or mixture of substances which, either whole or subdivided (such as the particles comprising a powder), is not capable of visually detectable flow as determined under ASTM D-4359-90.

(131~~2~~) "Special P~~p~~urpose S~~s~~pray A~~a~~dhesive" means an aerosol adhesive that meets any of the following definitions:

(A) "Mounting A~~a~~dhesive" means an aerosol adhesive designed to permanently mount photographs, artwork, and any other drawn or printed media to a backing (paper, board, cloth, etc.) without causing discoloration to the artwork.

(B) "Flexible V~~v~~inyl A~~a~~dhesive" means an aerosol adhesive designed to bond flexible vinyl to substrates. Flexible vinyl means a nonrigid polyvinyl chloride plastic with at least five percent, by weight, of plasticizer content. A plasticizer is a material, such as a high boiling point organic solvent, that is incorporated into a vinyl to increase its flexibility, workability, or distensibility, and may be determined using ASTM Method E260-91 or from product formulation data.

(C) "Polystyrene Foam Adhesive" means an aerosol adhesive designed to bond polystyrene foam (e.g. Styrofoam®, expanded polystyrene foam, etc.) to substrates.

(D) "Automobile Headliner Adhesive" means an aerosol adhesive designed to bond together layers in motor vehicle headliners.

(E) "Polyolefin Adhesive" means an aerosol adhesive designed to bond polyolefins (e.g. polyethylene, polypropylene, etc.) to substrates.

(F) "Laminate Repair/Edgebanding Adhesive" means an aerosol adhesive designed for:

(1) the touch-up or repair of items laminated with high pressure laminates (e.g. lifted edges, delaminations, etc.), or for
(2) the touch-up, repair, or attachment of edgebanding materials, including, but not limited to, other laminates, synthetic marble, veneers, wood moulding, and decorative metals.

For the purposes of this definition "high pressure laminate" means sheet materials which consist of paper, fabric, or other core material that have been laminated at temperatures exceeding 265 degrees F, and at pressures between 1,000 and 1,400 psi.

(G) "Automotive Engine Compartment Adhesive" means an aerosol adhesive

designed for use in motor vehicle under-the-hood applications which require oil and plasticizer resistance, as well as high shear strength, at temperatures of 200-275° F.

(132~~3~~) "Spot Remover" means any product labeled to clean localized areas, or remove localized spots or stains on cloth or fabric such as drapes, carpets, upholstery, and clothing, that does not require subsequent laundering to achieve stain removal. "Spot Remover" does not include "Dry Cleaning Fluid," "Laundry Prewash," or "Multi-purpose Solvent."

(133~~4~~) "Spray Buff Product" means a product designed to restore a worn floor finish in conjunction with a floor buffing machine and special pad.

(134~~5~~) "Table B Compound" means any carbon-containing compound listed as an exception to the definition of VOC in Section 94508.

(135) "Temporary Hair Color" means any product that applies color, glitter, or UV-active pigments to hair, wigs, or fur and is removable when washed. "Temporary Hair Color" includes hair color mousses and products labeled to add texture or thickness to cover thinning/balding areas. "Temporary Hair Color" does not include "Hair Spray," "Hair Styling Product," or "Hair Mousse."

(136) "Terrestrial" means to live on or grow from land.

(137) "Tire Sealant and Inflator" means any pressurized product that is designed to temporarily inflate and seal a leaking tire.

(138) "Toilet/Urinal Care Product" means any product designed or labeled to clean and/or to deodorize toilet bowls, toilet tanks, or urinals. Toilet bowls, toilet tanks, or urinals includes, but is not limited to, toilets or urinals connected to permanent plumbing in buildings and other structures, portable toilets or urinals placed at temporary or remote locations, and toilet or urinals in vehicles such as buses, recreational motor homes, boats, ships, and aircraft. "Toilet/Urinal Care Product" does not include "Bathroom and Tile Cleaner" or "General Purpose Cleaner."

(139) "Type A Propellent" means a compressed gas such as CO_2, N_2, N_2O, or compressed air which is used as a propellent, and is either incorporated with the product or contained in a separate chamber within the product's packaging.

(140) "Type B Propellent" means any halocarbon which is used as a propellent including chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and hydrofluorocarbons (HFCs).

(141) "Type C Propellent" means any propellent which is not a Type A or Type B propellent, including propane, isobutane, n-butane, and dimethyl ether (also known as dimethyl oxide).

(142) "Undercoating" means any aerosol product designed to impart a protective, non-paint layer to the undercarriage, trunk interior, and/or firewall of motor vehicles to prevent the formation of rust or to deaden sound. "Undercoating" includes, but is not limited to, rubberized, mastic, or asphaltic products.

(143) "Usage Directions" means the text or graphics on the product's principal display panel, label, or accompanying literature which describes to the end user how and in what quantity the product is to be used.

(144) "Volatile Organic Compound (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:

(A) methane,
methylene chloride (dichloromethane),
1,1,1-trichloroethane (methyl chloroform),
trichlorofluoromethane (CFC-11),
dichlorodifluoromethane (CFC-12),
1,1,2-trichloro-1,2,2-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:

1. cyclic, branched, or linear, completely fluorinated alkanes;
2. cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
3. cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
4. sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds to carbon and fluorine, and

(B) 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),
perchloroethylene (tetrachloroethylene).

(145) "VOC Content" means the total weight of VOC in a product expressed as a percentage of the product weight (exclusive of the container or packaging), as determined pursuant to sections 94515(a) and (b).

(146) "Wasp and Hornet Insecticide" means any insecticide product that is designed for use against wasps, hornets, yellow jackets or bees by allowing the user to spray from a distance a directed stream or burst at the intended insects, or their hiding place.

(147) "Waterproofer" means a product designed and labeled exclusively to repel water from fabric or leather substrates. "Waterproofer" does not include "Fabric Protectants."

(148) "Wax" means a material or synthetic thermoplastic substance generally of high molecular weight hydrocarbons or high molecular weight esters of fatty acids or alcohols, except glycerol and high polymers (plastics). "Wax" includes, but is not limited to, substances derived from the secretions of plants and animals such as carnuba wax and beeswax, substances of a mineral origin such as ozocerite and paraffin, and synthetic polymers such as polyethylene.

(149) "Web Spray Adhesive" means any aerosol adhesive which is not a "Mmist Sspray Aadhesive" or "Sspecial Ppurpose Sspray Aadhesive."

(150) "Wood Cleaner" means a product labeled to clean wooden materials including but not limited to decking, fences, flooring, logs, cabinetry, and furniture. "Wood Cleaner" does not include "Dusting Aid," General Purpose Cleaner," "Furniture Maintenance Product," "Floor Wax Stripper," "Floor Polish or Wax," or products designed and labeled exclusively to preserve or color wood.

~~(151) "Wood Floor Wax" means wax-based products for use solely on wood floors.~~

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

94509. Standards for Consumer Products

(a) Except as provided in Sections 94510 (Exemptions), 94511 (Innovative Products), 94514 (Variances), 94540 through 94555 (Alternative Control Plan), and 94567(a)(1) (Hairspray Credit Program), Title 17, California Code of Regulations, no person shall sell, supply, offer for sale, or manufacture for sale in California any consumer product which, at the time of sale or manufacture, contains volatile organic compounds in excess of the limits specified in the following Table of Standards after the specified effective dates.

Table of Standards
Percent Volatile Organic Compound by Weight

Product Category	Effective Date [1]	VOC Standard [2]
Adhesive Removers*:		
Floor or Wall Covering Adhesive Remover	12/31/2006	5
Gasket or Thread Locking Adhesive Remover	12/31/2006	50
General Purpose Adhesive Remover	12/31/2006	20
Specialty Adhesive Remover	12/31/2006	70
[*See sections 94509(n) and 94512(d) for additional requirements that apply to adhesive removers.]		
Adhesives *:		
Aerosol	1/1/95	75
Mist Spray Adhesives	1/1/2002	65
Web Spray Adhesives	1/1/2002	55
Special Purpose Spray Adhesives		
Mounting, Automotive Engine Compartment, and Flexible Vinyl Adhesives	1/1/2002	70
Polystyrene Foam and Automobile Headliner Adhesives	1/1/2002	65
Polyolefin and Laminate Repair/Edgebanding Adhesives	1/1/2002	60
[See 94509(i), 94512(d), and 94513(d) for additional requirements that apply to aerosol adhesives.]		
Construction, Panel, and Floor Covering* **	1/1/95 12/31/2002	40 15

	12/31/2008	7
[*See section 94509(p) for additional requirements that apply to Construction, Panel, and Floor Covering Adhesives.]		
Ceontact	1/1/95	80
Ceontact Aadhesive – Ggeneral Ppurpose	12/31/2006	55
Ceontact Aadhesive – Sspecial Ppurpose	12/31/2006	80
[See sections 94509(m) and 94512(d) for additional requirements that apply to Ceontact Aadhesives.]		
general purpose	1/1/95	10
* See section 94510(i) for an exemption that applies to adhesives sold in containers of one fluid ounce or less. ** See section 94509(k) for the effective date of the VOC limit for certain types of "Ceonstruction, Ppanel, and Ffloor Ceovering Aadhesives."		
Aerosol Cooking Sprays	1/1/95	18
Air Fresheners*:		
Double Ppphase Aaerosols	1/1/93 12/31/2004	30 25
Ssingle Ppphase Aaerosols	1/1/93 1/1/96	70 30
Ddual Ppurpose Aair Ffresheners/Ddisinfectant aerosols	1/1/94	60
liquid/pump sprays	1/1/93	18
solids/semisolid	1/1/93	3
[*See sections 94510(f) and 94510(g)(2) for exemptions that apply to certain Aair Ffresheners, and 94509(o) for additional requirements that apply to Aair Ffresheners.]		
Anti-static Product:		
Aaerosol	12/31/2008	80
non-aerosol	12/31/2006	11

~~Automotive Brake Cleaners~~	~~1/1/97~~ ~~12/31/2002~~	~~50~~ ~~45~~
Automotive Rubbing or Polishing Compounds	1/1/2005	17
Automotive Wax/Polish/Sealant/Glaze: all other forms	1/1/2005	15
hard paste waxes	1/1/2005	45
instant detailers	1/1/2001	3
Automotive Windshield Washer Fluids: Type "A" areas*	1/1/93 12/31/2008	35 25
All other areas (all forms)	1/1/93	10
Dilutable and Pre-Mixed-~~1/~~**	12/31/2002	1
~~1/~~ **See section 94508(a)(~~20~~19), section 94508(a)(~~21~~20), and section 94509(l) for provisions that apply to Automotive Windshield Washer Fluids.		
* Type "A" areas include only the following: Del Norte, Shasta and Trinity Counties; the Great Basin Valley, Lake Tahoe, Mountain Counties, and Northeast Plateau Air Basins, as defined in Title 17, California Code of Regulations, Sections 60105, 60108, 60111, and 60113.		
Bathroom and Tile Cleaners*: aerosols	1/1/94	7
all other forms	1/1/94	5
non-aerosol	12/31/2008	1
[*See section 94509(p) for additional requirements that apply to Bathroom and Tile Cleaners.]		
Brake Cleaners	1/1/97 12/31/2002 12/31/2008	50 45 10
Bug and Tar Remover	1/1/2002	40

Carburetor or Fuel-injection Air Intake Cleaners ** ========== ** See section 94509(k) for the effective date of the VOC limit for Carburetor or Ffuel-injection Aair lintake Ceaners.	1/1/95 12/31/2002 12/31/2008 ==========	75 45 10 ==========
Carpet and Upholstery Cleaner: Aaerosols ---------- non-aerosols (dilutables) ---------- non-aerosols (ready-to-use)	 1/1/2001 ---------- 1/1/2001 ---------- 1/1/2001	 7 ---------- 0.1 ---------- 3
Charcoal Lighter Material	See 94509(h)	
Disinfectant: aerosol ---------- non-aerosol	12/31/2008 ---------- 12/31/2008	70 ---------- 1
Dusting Aids: Aaerosol ---------- all other forms	 1/1/95 1/1/97 ---------- 1/1/95	 35 25 ---------- 7
Electrical Cleaner* ========== [*See sections 94509(n) and 94512(d) for additional requirements that apply to Eelectrical Ceaners.]	12/31/2006 ==========	45 ==========
Electronic Cleaner* ========== [*See sections 94509(m)and 94512(d) for additional requirements that apply to Eelectrical Ceaners.]	12/31/2006 ==========	75 ==========
Engine Degreasers: ---------- aerosols ---------- non-aerosols	1/1/93 1/1/96 ---------- 12/31/2004 12/31/2008 ---------- 12/31/2004	75 50 ---------- 35 10 ---------- 5
Fabric Refresher: Aaerosol ---------- Non-aerosol	 12/31/2006 ---------- 12/31/2006	 15 ---------- 6
Fabric Protectants	1/1/95 1/1/97	75 60

Floor Polishes/ or Waxes:		
~~products for~~ Resilient ~~flexible~~ Fflooring Mmaterials	1/1/94 12/31/2010	7 1
~~products for~~ Nnonresilient Fflooring Materials	1/1/94 12/31/2010	10 1
Wwood Ffloor Wwax	1/1/94	90
Floor Wax Stripper: Nnon-aerosols	See Section 94509(j)	
Footweare or Leather Care Product*:		
Aaerosol	12/31/2006	75
solid	12/31/2006	55
all other forms	12/31/2006	15
[*See section 94509(m) for additional requirements that apply to Ffootweare or Lleather Ceare Pproducts.]		
Furniture Maintenance Products:		
Aaerosols	1/1/94 12/31/2004	25 17
all other forms (except solid/paste forms)	1/1/94	7
non-aerosol	12/31/2008	3
General Purpose Cleaners*:		
aerosols and non-aerosols:	1/1/94	10
aerosols	12/31/2008	8
non-aerosols	12/31/2004	4
[*See section 94509(p) for additional requirements that apply to General Purpose Cleaners.]		
General Purpose Degreasers*:		
Aaerosols	1/1/2002 12/31/2008	50 10
non-aerosols	12/31/2004	4
[*See section 94509(m) for additional requirements that apply to Ggeneral Ppurpose Ddegreasers.]		

Glass Cleaners: Aaerosols	1/1/93	12
non-aerosols	1/1/93 1/1/96 12/31/2004	8 6 4
Graffiti Remover*: Aaerosols	12/31/2006	50
non-aerosols	12/31/2006	30
[*See section 94509(n) for additional requirements that apply to Ggraffiti Rremovers.]		
Hair Mousses	1/1/94 12/31/2002	16 6
Hair Shine	1/1/2005	55
Hair Spray	1/1/93 6/1/99	80 55
Hair Styling Gels	1/1/94	6
Hair Styling Product: aerosols and pump sprays	12/31/2006	6
all other forms	12/31/2006	2
Heavy-duty Hand Cleaners or Soap	1/1/2005	8
Insect Repellents: Aaerosols	1/1/94	65
Insecticides*: Crawling Bbug Insecticide (all forms):	1/1/95 1/1/98	40 20
aerosol Ccrawling Bbug linsecticides	12/31/2004	15
Fflea and Ttick Insecticide	1/1/95	25
Fflying Bbug Insecticide (all forms):	1/1/95	35
aerosols	12/31/2003	25
foggers	1/1/95	45
Llawn and Ggarden Insecticide (all forms)	1/1/95	20
non-aerosol Llawn and Ggarden linsecticides	12/31/2003	3
Wwasp and Hhornet Insecticide	1/1/2005	40

* See sections 94510(g)(1) and 94510(k) for exemptions that apply to certain insecticides.		
Laundry Prewash: ~~A~~aerosols/solids	1/1/94	22
all other forms	1/1/94	5
Laundry Starch/Sizing/Fabric Finish Product~~s~~:	1/1/95 12/31/2008	5 4.5
Metal Polish/Cleanser	1/1/2005	30
Multi-purpose Lubricant: (excluding solid or semisolid products)	1/1/2003	50
Nail Polish Removers	1/1/94 1/1/96 ~~12/31/2004~~ 12/31/2007	85 75 ~~0~~ 1
Non-selective Terrestrial Herbicide: ~~N~~non-aerosols	1/1/2002	3
Oven Cleaners*: aerosols/pump sprays	1/1/93	8
liquid	1/1/93	5
non-aerosol (including pump sprays and liquids)	12/31/2008	1
[*See section 94509(p) for additional requirements that apply to Oven Cleaners.]		
Paint Remover or Stripper	1/1/2005	50
Penetrant	1/1/2003	50
Personal Fragrance Products*: ~~P~~products with 20% or less fragrance	1/1/95 1/1/99	80 75
products with more than 20% fragrance	1/1/95 1/1/99	70 65
* See sections 94510(h), 94510(j), and 94510(l) for exemptions that apply to Ppersonal Ffragrance Pproducts.		
Rubber ~~and~~ /Vinyl Protectant: ~~A~~aerosols	1/1/2005	10
non-aerosols	1/1/2003	3

Sanitizer: aerosol	12/31/2008	70
non-aerosol	12/31/2008	1
Sealants and Caulking Compounds	12/31/2002	4
Shaving Creams	1/1/94	5
Shaving Gel	12/31/2006 12/31/2009	7 4
Silicone-based Multi-purpose Lubricant: (excluding solid or semisolid products)	1/1/2005	60
Spot Remover: Aaerosols	1/1/2001	25
non-aerosols	1/1/2001	8
Temporary Hair Color: Aerosol	12/31/2010	55
Tire Sealants and Inflators	12/31/2002	20
Toilet/Urinal Care Product:* Aaerosol	12/31/2006	10
non-aerosol	12/31/2006	3
[* See section 94509(o) for additional requirements that apply to Toilet/Urinal Care Products]		
Undercoating: Aaerosols	1/1/2002	40
Wood Cleaner: Aaerosol	12/31/2006	17
non-aerosol	12/31/2006	4

[1] See section 94509(d) for the effective date of the VOC standards for products registered under FIFRA, and section 94509(c) and (d) for the "Ssell-through" allowed for products manufactured prior to the effective date of standards.

[2] See section 94510(c) for an exemption that applies to fragrances in consumer products, and section 94510(d) for an exemption that applies to LVP-VOCs.

(b) *Products that are diluted prior to use*

(1) Except for "Automotive Windshield Washer Fluids (Dilutable)," for consumer products for which the label, packaging, or accompanying literature specifically states that the product should be diluted with water or non-VOC solvent prior to use, the limits specified in subsection (a) shall apply to the product only after the minimum recommended dilution has taken place. For purposes of this subsection (b), "minimum recommended dilution" shall not include recommendations for

incidental use of a concentrated product to deal with limited special applications such as hard-to-remove soils or stains.

(2) For consumer products for which the label, packaging, or accompanying literature states that the product should be diluted with any VOC solvent prior to use, the limits specified in subsection (a) shall apply to the product only after the maximum recommended dilution has taken place.

(3) For "Automotive Windshield Washer Fluids (Dilutable)" for which the label, packaging, or accompanying literature specifically states that the product should be diluted with water or non-VOC solvent prior to use;

(A) the VOC limits specified in section 94509(a) shall apply to the product only after the minimum recommended dilution has taken place;

(B) for the purpose of complying with the VOC limits specified in section 94509(a), different dilution instructions for "Type A areas" and other areas of California may be specified on the product label if the dilution instructions meet the following criteria:

1. The instructions are readily visible, and

2. The instructions can be easily understood by the consumer, and

3. The instructions clearly specify the recommended dilutions to apply in "Type A areas" and in other areas of California, and

If the dilution instructions specified on the product label meet these criteria, the VOC limits specified in section 94509(a) shall apply to the product only after the minimum recommended dilution has taken place for the area in which the product is sold, supplied, or offered for sale.

(c) *Sell-through of products.*

(1) *Sell-through period.* Notwithstanding the provisions of Section 94509(a) or 94509(j), a consumer product manufactured prior to each of the effective dates specified for that product in the Table of Standards may be sold, supplied, or offered for sale for up to three years after each of the specified effective dates. This subsection (c) does not apply to:

(A) any consumer product that does not display on the product container or package the date on which the product was manufactured, or a code indicating such date, or

(B) any consumer product on which the manufacturer has used a code indicating the date of manufacture that is different than the code specified in section

94512(b)(2), but an explanation of the code has not been filed with the ARB Executive Officer by the deadlines specified in section 94512(c)(1) or section 94512(c)(2), or

(C) Solid Air Fresheners and Toilet/Urinal Care Products that contain para-dichlorobenzene; these products are subject to the one-year sell-through period specified in section 94509(o).

(D) Products contained in multi-unit packages, as specified below:

1. Subsection (c)(1) does not apply to any individual consumer products unit contained within a multi-unit package that is produced or assembled after January 1, 2006, where the multi-unit package does not display the date(s) or date-code(s) of the individual product units, or display the date of assembly, such that the displayed information is not readily observable without irreversibly disassembling any portion of the container or packaging.

2. For the purposes of this section, "date of assembly" means the date that the individual product units are assembled into the finished multi-unit package.

3. For multi-unit packages that display the "date of assembly" instead of the date(s) or date-code(s) of the individual product units, the "date of assembly" shall be the "date of manufacture" for all of the product units contained within the multi-unit package. In other words, all of the product units shall be deemed to have been manufactured on the date these units are assembled into the multi-unit package, even if the individual product units show different date(s) or date-code(s).

(2) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product subject to the Table of Standards in section 94509 must notify the purchaser of the product in writing of the date on which the sell-through period for that product will end, provided, however, that this notification must be given only if all of the following conditions are met:

(A) the product is being sold or supplied to a distributor or retailer;

(B) the sell-through period for the product will expire 6 months or less from the date the product is sold or supplied;

(C) the product does not comply with the lowest VOC standard that applies on the date the sell-through period ends; and

(D) the product is subject to a VOC standard with an effective date on or after December 31, 2004.

(d) *Products registered under FIFRA.* For those consumer products that are registered under the Federal Insecticide, Fungicide, and Rodenticide Act, (FIFRA; 7 U.S.C. Section 136-136y), the effective date of the VOC standards specified in subsection (a) is one year after the date specified in the Table of Standards. For those consumer products that are registered under FIFRA, the three year period provided in subsection (c) shall also begin one year after the date specified in the Table of Standards.

(e) *Products containing ozone-depleting compounds.* For any consumer product for which VOC standards are specified under subsection (a), no person shall sell, supply, offer for sale, or manufacture for sale in California any consumer product which contains any of the following ozone-depleting compounds:

CFC-11 (trichlorofluoromethane), CFC-12 (dichlorodifluoromethane),
CFC-113 (1,1,1-trichloro-2,2,2-trifluoroethane),
CFC-114 (1-chloro-1,1-difluoro-2-chloro-2,2-difluoroethane),
CFC-115 (chloropentafluoroethane), halon 1211 (bromochlorodifluoromethane),
halon 1301 (bromotrifluoromethane), halon 2402 (dibromotetrafluoroethane),
HCFC-22 (chlorodifluoromethane),
HCFC-123 (2,2-dichloro-1,1,1-trifluoroethane),
HCFC-124 (2-chloro-1,1,1,2-tetrafluoroethane),
HCFC-141b (1,1-dichloro-1-fluoroethane), HCFC-142b
(1-chloro-1,1-difluoroethane), 1,1,1-trichloroethane, and carbon tetrachloride.

(f) The requirements of section 94509 (e) shall not apply to any existing product formulation that complies with the Table of Standards or any existing product formulation that is reformulated to meet the Table of Standards, provided the ozone depleting compound content of the reformulated product does not increase.

(g) The requirements of section 94509 (e) shall not apply to any ozone depleting compounds that may be present as impurities in a consumer product in an amount equal to or less than 0.01% by weight of the product.

(h) *Requirements for charcoal lighter materials.* The following requirements shall apply to all charcoal lighter material products as defined in section 94508(a)(27):

(1) *Regulatory Standards*

(A) In all areas of California except the South Coast Air Quality Management District, no person shall sell, supply, or offer for sale after January 1, 1993 any charcoal lighter material product unless at the time of the transaction:

1. the manufacturer or distributor of the charcoal lighter material has been issued a currently effective certification pursuant to subsection (h)(2).

2. the charcoal lighter material meets the formulation criteria and other

conditions specified in the applicable Executive Order issued pursuant to subsection (h)(2).

3. the product usage directions for the charcoal lighter material are the same as those provided to the Executive Officer pursuant to subsection (h)(2)(C).

(B) In the South Coast Air Quality Management District, the regulatory standards specified in subsection (h)(1)(A) shall be applicable upon the effective date of this subsection.

(2) *Certification Requirements*

(A) No charcoal lighter material formulation shall be certified under this subsection unless the applicant for certification demonstrates to the Executive Officer's satisfaction that the VOC emissions from the ignition of charcoal with the charcoal lighter material are less than or equal to 0.020 pound of VOC per start, using the procedures specified in the South Coast Air Quality Management District Rule 1174 Ignition Method Compliance Certification Protocol, dated February 27, 1991 (the "SCAQMD Rule 1174 Testing Protocol"). The provisions relating to LVP-VOC in sections 94508(a)(9~~1~~0) and 94510(d) shall not apply to any charcoal lighter material subject to the requirements of sections 94509(a) and (h).

(B) The Executive Officer may approve alternative test procedures which are shown to provide equivalent results to those obtained using the SCAQMD Rule 1174 Testing Protocol

(C) A manufacturer or distributor of charcoal lighter material may apply to the Executive Officer for certification of a charcoal lighter material formulation in accordance with this subsection (h)(2). The application shall be in writing and shall include, at a minimum, the following:

1. the results of testing conducted pursuant to the procedures specified in SCAQMD Rule 1174 Testing Protocol.

2. the exact text and/or graphics that will appear on the charcoal lighter material's principal display panel, label, and any accompanying literature. The provided material shall clearly show the usage directions for the product. These directions shall accurately reflect the quantity of charcoal lighter material per pound of charcoal that was used in the SCAQMD Rule 1174 Testing Protocol for that product, unless:

i) the charcoal lighter material is intended to be used in fixed amounts independent of the amount of charcoal used, such as certain paraffin cubes, or

ii) the charcoal lighter material is already incorporated into the charcoal, such as certain "bag light," "instant light," or "match light" products.

3. For a charcoal lighter material which meets the criteria specified in subsection (h)(2)(C)2.i), the usage instructions provided to the Executive Officer shall accurately reflect the quantity of charcoal lighter material used in the SCAQMD Rule 1174 Testing Protocol for that product.

4. Any physical property data, formulation data, or other information required by the Executive Officer for use in determining when a product modification has occurred and for use in determining compliance with the conditions specified on the Executive Order issued pursuant to section (h)(2).

(D) Within 30 days of receipt of an application, the Executive Officer shall advise the applicant in writing either that it is complete or that specified additional information is required to make it complete. Within 30 days of receipt of additional information, the Executive Officer shall advise the applicant in writing either that the application is complete, or that specified additional information or testing is still required before it can be deemed complete.

(E) If the Executive Officer finds that an application meets the requirements of this subsection (h)(2), then he or she shall issue an Executive Order certifying the charcoal lighter material formulation and specifying such conditions as are necessary to insure that the requirements of this subsection (h) are met. The Executive Officer shall act on a complete application within 90 days after the application is deemed complete.

(3) *Notice of Modifications*

For any charcoal lighter material for which certification has been granted pursuant to subsection (h)(2), the applicant for certification shall notify the Executive Officer in writing within 30 days of: (i) any change in the usage directions, or (ii) any change in product formulation, test results, or any other information submitted pursuant to subsection (h)(2) which may result in VOC emissions greater than 0.020 pound of VOC per start.

(4) *Revocation of Certification*

If the Executive Officer determines that any certified charcoal lighter material formulation results in VOC emissions from the ignition of charcoal which are greater than 0.020 pound of VOC per start, as determined by the SCAQMD Rule 1174 Testing Protocol and the statistical analysis procedures contained therein, the Executive Officer shall revoke or modify the certification as is

necessary to assure that the charcoal lighter material will result in VOC emissions of less than or equal to 0.020 pound of VOC per start. The Executive Officer shall not revoke or modify the prior certification without first affording the applicant for the certification an opportunity for a hearing in accordance with the procedures specified in Title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 1, Article 4 (commencing with section 60040), to determine if the certification should be modified or revoked.

(5) Notwithstanding any other provision of this subsection 94509(h), charcoal lighter material products manufactured prior to January 1, 1993, may be sold, supplied, or offered for sale until July 1, 1994, in all areas of California except the South Coast Air Quality Management District. Charcoal lighter material products subject to SCAQMD Rule 1174 and sold, supplied, or offered for sale in the South Coast Air Quality Management District shall meet the requirements of section 94509(h) upon the effective date of this subsection, regardless of the date on which the products were manufactured.

(i) *Requirements for aerosol adhesives.* (as defined in sections 94508(a)(1) and 94508(a)(3)).

(1) As specified in Health and Safety Code section 41712(h)(2), the standards for aerosol adhesives apply to all uses of aerosol adhesives, including consumer, industrial, and commercial uses. Except as otherwise provided in sections 94509(c), 94510, 94511, and 94514, no person shall sell, supply, offer for sale, use or manufacture for sale in California any aerosol adhesive which, at the time of sale, use, or manufacture, contains VOCs in excess of the specified standard.

(2)(A) In order to qualify as a "Special Purpose Spray Adhesive" the product must meet one or more of the definitions for "Special Purpose Spray Adhesive" specified in section 94508(a)(1312), but if the product label indicates that the product is suitable for use on any substrate or application not listed in one of the definitions for "Special Purpose Spray Adhesive," then the product shall be classified as either a "Web Spray Adhesive" or a "Mist Spray Adhesive."

(B) If a product meets more than one of the definitions specified in section 94508(a)(1312) for "Special Purpose Spray Adhesive," and is not classified as a "Web Spray Adhesive" or "Mist Spray Adhesive" under subsection (2)(A), then the VOC limit for the product shall be the lowest applicable VOC limit specified in section 94509(a).

(3) Effective 1/1/2002, no person shall sell, supply, offer for sale, or manufacture for use in California any aerosol adhesive which contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene, except ~~than~~ that an aerosol adhesive manufactured

before 1/1/2002 may be sold, supplied, or offered for sale until 1/1/2005, so long as the product container or package displays the date on which the product was manufactured, or a code indicating such date.

(4) All aerosol adhesives must comply with the labeling requirements specified in section 94512(d), and all manufacturers and responsible parties for aerosol adhesives must comply with the special reporting requirements specified in section 94513(d).

(j) *Requirements for Floor Wax Strippers.* After an effective date of January 1, 2002, no person shall sell, supply, offer for sale, or manufacture for use in California any floor wax stripper unless the following requirements are met:

(1) The label of each non-aerosol floor wax stripper must specify a dilution ratio for light or medium build-up of polish that results in an as-used VOC concentration of 3 percent by weight or less.

(2) If a non-aerosol floor wax stripper is also intended to be used for removal of heavy build-up of polish, the label of that floor wax stripper must specify a dilution ratio for heavy build-up of polish that results in an as-used VOC concentration of 12 percent by weight or less.

(3) The terms "light build-up," "medium build-up" or "heavy build-up" are not specifically required, as long as comparable terminology is used.

(k) *Effective dates of the VOC limits for "Carburetor or Fuel-injection Air Intake Cleaners" and "Construction, Panel, and Floor Covering Adhesives."* The definitions for the product categories of "Carburetor or Fuel-injection Air Intake Cleaners" and "Construction, Panel, and Floor Covering Adhesives" were modified as part of the "Mid-term Measures II" rulemaking action that was considered by the Board in October 1999. As a result of these modifications, certain types of consumer products were included in these definitions that had not previously been included. For those consumer products that were included in these definitions for the first time as a result of the "Mid-term Measures II" rulemaking action, the VOC limits (in section 94509(a)) applicable to these newly included products shall not become legally effective until December 31, 2002.

(l) *Automotive Windshield Washer Fluids.* The provisions of subsection 94509(b)(1) shall not apply to "Automotive Windshield Washer Fluid (Pre-Mixed)" as defined in section 94508(a)(20~~1~~4).

(m) *Requirements for Contact Adhesives, Electronic Cleaners, Footwear or Leather Care Products, and General Purpose Degreasers.*

(1) Except as provided below in sections 94509(m)(2) and (m)(4), effective December 31, 2005, no person shall sell, supply, offer for sale, or manufacture for use in California any Contact Adhesive, Electronic Cleaner, Footwear or Leather Care Product, or General Purpose Degreaser that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

(2) *Sell-through of Products.* Contact Adhesives, Electronic Cleaners, Footwear or Leather Care Products, and General Purpose Degreasers that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2005, may be sold, supplied, or offered for sale until December 31, 2008, so long as the product container or package displays the date on which the product was manufactured, or a code indicating such date.

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(m)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2008, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2008.

(4) *Impurities.* The requirements of section 94509(m)(1) and (m)(3) shall not apply to any Contact Adhesive, Electronic Cleaner, Footwear or Leather Care Product, or General Purpose Degreaser containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

(n) *Requirements for Adhesive Removers, Electrical Cleaners, and Graffiti Removers.*

(1) Except as provided below in sections 94509(n)(2) and (n)(4), effective December 31, 2006, no person shall sell, supply, offer for sale, or manufacture for use in California any Adhesive Remover, Electrical Cleaner, or Graffiti Remover that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

(2) *Sell-through of Products.* Adhesive Removers, Electrical Cleaners, and Graffiti Removers that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2006, may be

sold, supplied, or offered for sale until December 31, 2009, so long as the product container or package displays the date on which the product was manufactured, or a code indicating such date.

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(n)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2009, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2009.

(4) *Impurities.* The requirements of section 94509(n)(1) and (n)(3) shall not apply to any Adhesive Remover, Electrical Cleaner, or Graffiti Remover containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

(o) *Requirements for Solid Air Fresheners and Toilet/Urinal Care Products.*

(1) Effective December 31, 2005, no person shall sell, supply, offer for sale, or manufacture for use in California any Solid Air Fresheners or Toilet/Urinal Care Products that contain para-dichlorobenzene, except that Solid Air Fresheners and Toilet/Urinal Care Products that contain para-dichlorobenzene and were manufactured before December 31, 2005 may be sold, supplied, or offered for sale until December 31, 2006, so long as the product container or package displays the date on which the product was manufactured, or a code indicating such date.

(2) *Notification for products sold during the sell-through period.* Any person who sells or supplies any Solid Air Freshener or Toilet/Urinal Care Product that contains para-dichlorobenzene must notify the purchaser of the product in writing that the sell-through period for the product will end on December 31, 2006, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2006.

(p) *Requirements for Bathroom and Tile Cleaners, Construction, Panel, and Floor Covering Adhesives, General Purpose Cleaners, and Oven Cleaners.*

(1) Except as provided below in sections 94509(p)(2) and (p)(4), effective December 31, 2008, no person shall sell, supply, offer for sale, or

manufacture for use in California any Bathroom and Tile Cleaner, Construction, Panel, and Floor Covering Adhesive, General Purpose Cleaner, or Oven Cleaner that contains any of the following compounds: methylene chloride, perchloroethylene, or trichloroethylene.

(2) *Sell-through of Products.* Bathroom and Tile Cleaners, Construction, Panel, and Floor Covering Adhesives, General Purpose Cleaners, and Oven Cleaners that contain methylene chloride, perchloroethylene, or trichloroethylene and were manufactured before December 31, 2008, may be sold, supplied, or offered for sale until December 31, 2011, so long as the product container or package displays the date on which the product was manufactured, or a code indicating such date.

(3) *Notification for products sold during the sell-through period.* Any person who sells or supplies a consumer product identified above in section 94509(p)(1) must notify the purchaser of the product in writing that the sell-through period for that product will end on December 31, 2011, provided, however, that this notification must be given only if both of the following conditions are met:

(A) the product is sold or supplied to a distributor or retailer; and

(B) the product is sold or supplied on or after June 30, 2011.

(4) *Impurities.* The requirements of section 94509(p)(1) and (p)(3) shall not apply to any Bathroom and Tile Cleaner, Construction, Panel, and Floor Covering Adhesive, Energized Electronic Cleaner, General Purpose Cleaner, or Oven Cleaner containing methylene chloride, perchloroethylene, or trichloroethylene that is present as an impurity in a combined amount equal to or less than 0.01% by weight.

NOTE: Authority cited: Sections 39600, 39601, 39650, 39658, 39659, 39666, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 39650, 39655, 39656, 39658, 39659, 39666, 40000, and 41712, Health and Safety Code.

94510. Exemptions.

(a) This article shall not apply to any consumer product manufactured in California for shipment and use outside of California.

(b) The provisions of this article shall not apply to a manufacturer or distributor who sells, supplies, or offers for sale in California a consumer product that does not comply with the VOC standards specified in Section 94509, as long as the manufacturer or distributor can demonstrate both that the consumer product is intended for shipment and use outside of California, and that the manufacturer or distributor has taken reasonable prudent precautions to assure that the consumer product is not distributed to California. This subsection (b) does not apply to

consumer products that are sold, supplied, or offered for sale by any person to retail outlets in California.

(c) The VOC limits specified in Section 94509(a) shall not apply to fragrances up to a combined level of 2 percent by weight contained in any consumer product.

(d) The VOC limits specified in Section 94509(a) shall not apply to any LVP-VOC.

(e) The requirements of Section 94512(b) shall not apply to consumer products registered under the Federal Insecticide, Fungicide, and Rodenticide Act, (FIFRA; 7 U.S.C. Section 136~~/~~-136y).

(f) The VOC limits specified in Section 94509(a) shall not apply to air fresheners that are comprised entirely of fragrance, less compounds not defined as VOCs under Section 94508 or exempted under Section 94510(d).

(g) The VOC limits specified in Section 94509(a) shall not apply to:

(1) insecticides containing at least 98% para-dichlorobenzene.

(2) Until December 30, 2006, the VOC limits specified in Section 94509(a) shall not apply to solid air fresheners containing at least 98% para-dichlorobenzene. On or after December 31, 2006, the provisions of section 94509(o) apply to solid air fresheners containing para-dichlorobenzene.

(h) The VOC limits specified in Section 94509(a) shall not apply to:

(1) existing personal fragrance products or personal fragrance products in development on or before April 1, 1992, provided that both (i) the registration data specified in section 94513 is submitted for every such product by the date specified in section 94513(a), or prior to July 1, 1993, whichever date occurs later, and (ii) such product is sold in California prior to January 1, 1994. For the purposes of this subsection, a product "in development" means:

(A) a product which a fragrance materials manufacturer is designing at the request of a personal fragrance product manufacturer, or

(B) a product which is the subject of a written marketing profile or other documentation authorizing the creation and marketing of the product.

(2) ~~P~~personal fragrance products in development may be registered to qualify for this exemption under hypothetical trade names or pseudonyms, provided that the actual trade name is supplied to the Executive Officer within 30 days of marketing such products, or January 1, 1994, whichever occurs first.

(i) The VOC limits specified in Section 94509(a) shall not apply to adhesives sold in containers of 1 fluid ounce or less.

(j) The VOC limits specified in Section 94509(a) shall not apply to any VOC which is a fragrance in a personal fragrance product.

(k) The VOC limits specified in Section 94509(a) shall not apply to bait station insecticides. For the purpose of this section, bait station insecticides are containers enclosing an insecticidal bait that is not more than 0.5 ounce by weight, where the bait is designed to be ingested by insects and is composed of solid material feeding stimulants with less than 5 percent (%) active ingredients.

(l) The 1/1/99 VOC limits specified in Section 94509(a) for personal fragrance products shall not apply to such products which have been sold in California prior to 1/1/99.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

94511. Innovative Products.

(a) The Executive Officer shall exempt a consumer product from the VOC limits specified in Section 94509(a) if a manufacturer demonstrates by clear and convincing evidence that, due to some characteristic of the product formulation, design, delivery systems or other factors, the use of the product will result in less VOC emissions as compared to:

(1) the VOC emissions from a representative consumer product which complies with the VOC limits specified in Section 94509(a), or

(2) the calculated VOC emissions from a noncomplying representative product, if the product had been reformulated to comply with the VOC limits specified in section 94509(a). VOC emissions shall be calculated using the following equation:

$$E_R = E_{NC} \times VOC_{STD} \div VOC_{NC}$$

where:

E_R = The VOC emissions from the noncomplying representative product, had it been reformulated.

E_{NC} = The VOC emissions from the noncomplying representative product in its current formulation.

VOC_{STD} = the VOC limit specified in 94509(a).

VOC_{NC} = the VOC content of the noncomplying product in its current formulation.

If a manufacturer demonstrates that this equation yields inaccurate results due to some characteristic of the product formulation or other factors, an alternative method which accurately calculates emissions may be used upon approval of the Executive Officer.

(b) For the purposes of this section, "representative consumer product" means a consumer product which meets all of the following criteria:

(1) the representative product shall be subject to the same VOC limit in Section 94509(a) as the innovative product.

(2) the representative product shall be of the same product form as the innovative product, unless the innovative product uses a new form which does not exist in the product category at the time the application is made.

(3) the representative product shall have at least similar efficacy as other consumer products in the same product category based on tests generally accepted for that product category by the consumer products industry.

(c) A manufacturer shall apply in writing to the Executive Officer for any exemption claimed under subsection (a). The application shall include the supporting documentation that demonstrates the reduction of emissions from the innovative product, including the actual physical test methods used to generate the data and, if necessary, the consumer testing undertaken to document product usage. In addition, the applicant must provide any information necessary to enable the Executive Officer to establish enforceable conditions for granting the exemption including the VOC content for the innovative product and test methods for determining the VOC content. All information submitted by a manufacturer pursuant to this section shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations, Sections 91000-91022.

(d) Within 30 days of receipt of the exemption application the Executive Officer shall determine whether an application is complete as provided in section 60030(a), Title 17, California Code of Regulations.

(e) Within 90 days after an application has been deemed complete, the Executive Officer shall determine whether, under what conditions, and to what extent, an exemption from the requirements of Section 94509(a) will be permitted. The applicant and the Executive Officer may mutually agree to a longer time period for reaching a decision, and additional supporting documentation may be submitted by the applicant before a decision has been reached. The Executive Officer shall notify the applicant of the decision in writing and specify such terms and conditions that are necessary to insure that emissions from the product will meet the emissions reductions specified in subsection (a), and that such emissions reductions can be enforced.

(f) In granting an exemption for a product the Executive Officer shall establish conditions that are enforceable. These conditions shall include the VOC content of the innovative product, dispensing rates, application rates, and any other parameters determined by the Executive Officer to be necessary. The Executive Officer shall also specify the test methods for determining conformance to the conditions established. The test methods shall include criteria for reproducibility, accuracy, and sampling and laboratory procedures.

(g) For any product for which an exemption has been granted pursuant to this section, the manufacturer shall notify the Executive Officer in writing within 30 days of any change in the product formulation or recommended product usage directions, and shall also notify the Executive Officer within 30 days if the manufacturer learns of any information which would alter the emissions estimates submitted to the Executive Officer in support of the exemption application.

(h) If the VOC limits specified in Section 94509(a) are lowered for a product category through any subsequent rulemaking, all innovative product exemptions granted for products in the product category, except as provided in this subsection (h), shall have no force and effect as of the effective date of the modified VOC standard. This subsection (h) shall not apply to those innovative products which have VOC emissions less than the applicable lowered VOC limit and for which a written notification of the product's emissions status versus the lowered VOC limit has been submitted to and approved by the Executive Officer at least 60 days before the effective date of such limits.

(i) If the Executive Officer believes that a consumer product for which an exemption has been granted no longer meets the criteria for an innovative product specified in subsection (a), the Executive Officer may modify or revoke the exemption as necessary to assure that the product will meet these criteria. The Executive Officer shall not modify or revoke an exemption without first affording the applicant an opportunity for a public hearing held in accordance with the procedures specified in Title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 1, Article 4 (commencing with Section 60040), to determine if the exemption should be modified or revoked.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

94512. Administrative Requirements.

(a) *Most Restrictive Limit.*

(1) *Products Manufactured Before January 1, 2007, and FIFRA-registered Insecticides Manufactured Before January 1, 2008.* Notwithstanding the definition of "Pproduct Ceategory" in Section 94508, if anywhere on the principal display panel of any consumer product manufactured before January 1, 2007, *or any FIFRA-*

registered insecticide manufactured before January 1, 2008, any representation is made that the product may be used as, or is suitable for use as a consumer product for which a lower VOC limit is specified in Section 94509(a), then the lowest VOC limit shall apply. This requirement does not apply to general purpose cleaners and insecticide foggers.

(2) *Products Manufactured on or After January 1, 2007, and FIFRA-registered Insecticides Manufactured on or After January 1, 2008.* Notwithstanding the definition of "product category" in Section 94508, if anywhere on the container or packaging of any consumer product manufactured on or after January 1, 2007, *or any FIFRA-registered insecticide manufactured on or after January 1, 2008,* or on any sticker or label affixed thereto, any representation is made that the product may be used as, or is suitable for use as a consumer product for which a lower VOC limit is specified in Section 94509(a), then the lowest VOC limit shall apply. This requirement does not apply to general purpose cleaners and insecticide foggers.

(3) *Rules that Apply when a Product Category Definition Excludes Other Product Categories.*

If a definition of a regulated product category in section 94508(a) states that the product category "does not include" one or more other product categories, the "most restrictive limit" provisions of section 94512(a) apply to regulated products that meet the definition of the regulated product category and also make any representation that the regulated product may be used as (or is suitable for use as) a product that falls within one or more of the excluded product categories.

For example, if the definition for Regulated Product Category A states that it "does not include" Regulated Product Category B, then the "most restrictive limit" provisions apply to a regulated product that meets the definition of Regulated Product Category A, but also makes a representation that it may be used as (or is suitable for use as) Regulated Product Category B. In other words, if the regulated product makes any representation that it may be used as (or is suitable for use as) Regulated Category Product B, then the regulated product would be subject to the lowest VOC limit specified in section 94509(a) for either Product Category A or Product Category B.

For the purposes of this section:

"Regulated product" means a consumer product for which a VOC standard is specified in section 94509(a), and

"Representation" has the same meaning as used above in subsections 94512(a)(1) and 94512(a)(2) (i.e., what statements qualify as a "representation" depends on the date the product was manufactured and whether the statements appear on the "principal display panel" or other parts of the product container or packaging.)

(b) *Product Dating.*

(1) Each manufacturer of a consumer product subject to Section 94509 shall clearly display on each consumer product container or package, the day, month, and year on which the product was manufactured, or a code indicating such date.

(2) A manufacturer who uses the following code to indicate the date of manufacture shall not be subject to the requirements of section 94512(c)(1), if the code is represented separately from other codes on the product container so that it is easily recognizable:

YY DDD = year year day day day

Where: "YY" = two digits representing the year in which the product was manufactured, and

"DDD" = three digits representing the day of the year on which the product was manufactured, with "001" representing the first day of the year, "002" representing the second day of the year, and so forth (i.e. the "Julian date")

(3) This date or code shall be displayed on each consumer product container or package no later than twelve months prior to the effective date of the applicable standard specified in Section 94509.

(4) Except as otherwise provided in subsection (b)(5), for products manufactured on or after January 1, 2006, the date or code shall be displayed on the product container such that it is readily observable without irreversibly disassembling any portion of the product container or packaging. For the purposes of this subsection, information may be displayed on the bottom of a container as long as it is clearly legible without removing any product packaging.

(5) *Products Sold in Multi-unit Packages.*

(A) Products sold, supplied, or offered for sale in multi-unit packages are not required to comply with subsection (b)(4).

(B) If a multi-unit package does not comply with subsection (b)(4), the "sell-through" provisions of section 94509(c)(1) shall not apply to the individual product units contained within the multi-unit package. In other words, if any multi-unit package produced or assembled after January 1, 2006, does not display the date(s) or date-code(s) of the product units, such that the displayed information is readily observable without irreversibly disassembling any portion of the container or packaging, the individual product units shall be subject to the VOC standards in effect when the multi-unit package is sold,

supplied, or offered for sale, regardless of the date on which the product units were manufactured.

(C) A multi-unit package may comply with subsection (b)(4) by displaying the date of assembly instead of the date(s) or date-code(s) of the individual product units, so long as the date of assembly is readily observable without irreversibly disassembling any portion of the container or packaging. The "date of assembly" means the date that the individual product units are assembled into the finished multi-unit package. If the date of assembly is displayed instead of the individual date(s) or date-code(s), the "date of assembly" shall be the "date of manufacture" for all of the product units contained within the multi-unit package. In other words, all of the product units shall be deemed to have been manufactured on the date these units are assembled into the multi-unit package, even if the individual product units show different date(s) or date-code(s), and the "date of assembly" shall be "date of manufacture" of each product unit for the purposes of applying the "sell-through" provisions of section 94509(c).

(6) The requirements of this subsection (b) shall not apply to:

(A) personal fragrance products of 2 milliliters or less, which are offered to consumers free of charge for the purpose of sampling the product; or

(B) products containing no VOCs (as defined in section 94508), or containing VOCs at 0.10% by weight or less.

(c) *Additional Product Dating Requirements*

(1) If a manufacturer uses a code indicating the date of manufacture, for any consumer product subject to section 94509 an explanation of the code must be filed with the Executive Officer of the ARB no later than twelve months prior to the effective date of the applicable standard specified in section 94509. Thereafter, manufacturers using a code must file an explanation of the code with the Executive Officer on an annual basis, beginning in 2006. The explanation of the code must be received by the Executive Officer on or before January 31st of each year, with the first explanation due on or before January 31, 2006.

(2) If a manufacturer changes any code indicating the date of manufacture for any consumer product subject to subsection (c)(1), an explanation of the modified code must be received by the Executive Officer before any products displaying the modified code are sold, supplied, or offered for sale in California.

(3) No person shall erase, alter, deface, or otherwise remove or make illegible any date or code indicating the date of manufacture from any regulated product container without the express authorization of the manufacturer.

(4) Codes indicating the date of manufacture are public information and may not be claimed as confidential.

(d) *Additional Labeling Requirements for Aerosol Adhesives, Adhesive Removers, Electronic Cleaner, Electrical Cleaner, Energized Electrical Cleaner, and Contact Adhesives.*

(1) In addition to the requirements specified in subsections (a), (b), and (c), both the manufacturer and responsible party for each aerosol adhesive, adhesive remover, electronic cleaner, electrical cleaner, energized electrical cleaner, and contact adhesive product subject to this article shall ensure that all products clearly display the following information on each product container which is manufactured on or after the effective date for the category specified in section 94509(a):

(A) The product category as specified in section 94509(a) or an abbreviation of the category shall be displayed;

(B) 1. The applicable VOC standard for the product that is specified in section 94509(a), except for Energized Electrical Cleaner, expressed as a percentage by weight, shall be displayed unless the product is included in an alternative control plan approved by the Executive Officer, as provided in Article 4, Sections 94540-94555, Title 17, California Code of Regulations, and the product exceeds the applicable VOC standard;

2. If the product is included in an alternative control plan approved by the Executive Officer, and the product exceeds the applicable VOC standard specified in section 94509(a), the product shall be labeled with the term "ACP" or "ACP product;"

(C) If the product is classified as a special purpose spray adhesive, the applicable substrate and/or application or an abbreviation of the substrate/application that qualifies the product as special purpose shall be displayed;

(D) If the manufacturer or responsible party uses an abbreviation as allowed by the subsection 94512(d), and explanation of the abbreviation must be filed with the Executive Officer before the abbreviation is used.

(2) The information required in section 94512(d)(1), shall be displayed on the product container such that it is readily observable without removing or disassembling any portion of the product container or packaging. For the purposes of this subsection, information may be displayed on the bottom of a

container as long as it is clearly legible without removing any product packaging.

(3) No person shall remove, alter, conceal, or deface the information required in section 94512(d)(1) prior to final sale of the product.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

94513. Reporting Requirements.

(a) Upon 90 days written notice, the Executive Officer may require any responsible party to report information for any consumer product or products the Executive Officer may specify including, but not limited to, all or part of the information specified in the following subsections (a)(1) through (a)(12). If the responsible party does not have or does not provide the information requested by the Executive Officer, the Executive Officer may require the reporting of this information by the person that has the information, including, but not limited to, any formulator, manufacturer, supplier, parent company, private labeler, distributor, or repackager.

(1) the company name, address, telephone number, and designated contact person;

(2) any claim of confidentiality made pursuant to Title 17, California Code of Regulations, Section 91011;

(3) the product brand name for each consumer product and the product label;

(4) the product category to which the consumer product belongs;

(5) the applicable product form(s) listed separately;

(6) an identification of each product brand name and form as a "Household Product," "I&I Product," or both;

(7) separate California sales in pounds per year, to the nearest pound, and the method used to calculate California sales for each product form;

(8) for information submitted by multiple companies, an identification of each company which is submitting relevant data separate from that submitted by the responsible party. All information from all companies shall be submitted by the date specified in Section 94513(a);

(9) for each product brand name and form, the net percent by weight of the total product, less container and packaging, comprised of the following, rounded to the nearest one-tenth of a percent (0.1%):

(A) Total Table B Compounds
(B) Total LVP-VOCs that are not fragrances
(C) Total All Other Carbon-Containing Compounds that are not fragrances
(D) Total All Non-Carbon-Containing Compounds
(E) Total Fragrance
(F) For products containing greater than two percent by weight fragrance, but excluding "personal fragrance products":
  (i) the percent of fragrance that are LVP-VOCs, and
  (ii) the percent of fragrance that are all other carbon-containing compounds
(G) For "personal fragrance products," the density of the fragrance
(H) Total Para-dichlorobenzene

(10) for each product brand name and form, the identity, including the specific chemical name and associated Chemical Abstract Services (CAS) number, of the following:

(A) Each Table B Compound
(B) Each LVP-VOC that is not a fragrance

(11) if applicable, the weight percent comprised of propellant for each product;

(12) if applicable, an identification of the type of propellant (Type A, Type B, Type C, or a blend of the different types);

(b) In addition to the requirements of section 94513(a)(10), the responsible party shall report or shall arrange to have reported to the Executive Officer the net percent by weight of each ozone-depleting compound which is (1) listed in section 94509(e) and (2) contained in a product subject to reporting under section 94513(a) in any amount greater than 0.1 percent by weight.

(c) All information submitted by any person pursuant to Section 94513 shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations, Sections 91000-91022.

(d) *Special Reporting Requirements for Aerosol Adhesives*

On or before March 31, 2004, all responsible parties for aerosol adhesives shall report to the Executive Officer the following information for products sold or offered for sale in California:

(1) data regarding product sales and composition for the year 2003, including the information listed in Section 94513(a), and any other information that the Executive Officer may specify; and

(2) a written update of the research and development efforts undertaken to achieve

VOC limits lower than the limits specified in section 94509(a). The written update must include detailed information about the raw materials (solvents, propellants, resins, and polymers) and hardware (valves, actuators, cans) used in product reformulation, the testing protocols used, the results of the testing, and the cost of reformulation efforts.

(3) On or before December 31, 2003, the Executive Officer shall notify responsible parties in writing that they are to submit aerosol adhesive product and research data by March 31, 2004.

(e) *Special Reporting Requirements for Consumer Products that Contain Perchloroethylene or Methylene Chloride* ~~Consumer Products that Contain Perchloroethylene or Methylene Chloride~~:

(1) The requirements of this subsection shall apply to all responsible parties for:

(A) consumer products that are subject to section 94509(a) and contain perchloroethylene or methylene chloride, and

(B) Energized Electrical Cleaners as defined in section 94508(a) (47), that contain perchloroethylene or methylene chloride. For the purposes of this subsection, a product "contains perchloroethylene or methylene chloride" if the product contains 1.0 percent or more by weight (exclusive of the container or packaging) of either perchloroethylene or methylene chloride.

(2) For each consumer product that contains perchloroethylene or methylene chloride, the responsible party shall report the following information for products sold in California during each calendar year, beginning with the year 2000, and ending with the year 2010.

(A) the product brand name and a copy of the product label with legible usage instructions;

(B) the product category to which the consumer product belongs;

(C) the applicable product form(s) (listed separately);

(D) for each product form listed in (C), the total ~~amount of the consumer product sold~~ sales in California during the calendar year ~~between January 1, 1996 and December 31, 1996,~~ to the nearest pound (exclusive of the container or packaging), and the method used for calculating the California sales;

(E) the weight percent, to the nearest 0.10 percent, of perchloroethylene and methylene chloride in the consumer product~~;~~.

(3) The information specified in subsection 94513(e)(2) shall be reported for each calendar year by March 1 of the following year. The first report shall be due on March 1, 2001, for calendar year 2000. A new report is due on March 1 of each year thereafter, until March 1, 2011, when the last report is due.

(4) Upon request, the Executive Officer shall make the perchloroethylene information submitted pursuant to this subsection available to publicly owned treatment works in California, in accordance with the procedures for handling of confidential~~;~~ information specified in Title 17, California Code of Regulations, sections 91000-91022.

(A) On or before July 1, 2002, the Executive Officer shall evaluate the information, along with data on influent and effluent levels of perchloroethylene as reported by publicly-owned treatment works personnel and any other relevant information, to determine if it is likely that publicly-owned treatment works are experiencing increased levels of perchloroethylene, relative to 1996 levels, that can be attributed to consumer products which contain perchloroethylene.

(B) If the Executive Officer determines that it is likely that increased perchloroethylene levels at the publicly-owned treatment works are caused by increased levels of perchloroethylene in consumer products subject to this regulation, then the Executive Officer shall, in conjunction with the publicly-owned treatment works and other appropriate parties, implement measures which are feasible, appropriate, and necessary for reducing perchloroethylene levels at the publicly-owned treatment works.

NOTE: Authority cited: Sections 39600, 39601, 41511, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, 41511, and 41712, Health and Safety Code.

94514. Variances.

(a) *Applications for variances.* Any person who cannot comply with the requirements set forth in Section 94509, because of extraordinary reasons beyond the person's reasonable control may apply in writing to the Executive Officer for a variance. The variance application shall set forth:

(1) the specific grounds upon which the variance is sought;

(2) the proposed date(s) by which compliance with the provisions of Section 94509 will be achieved;

(3) a compliance report reasonably detailing the method(s) by which compliance will be achieved, and

(4) for applicants requesting a variance from the June 1, 1999, 55 percent VOC standard for hairspray products, the variance application shall also include a plan describing how the applicant will mitigate the excess VOC emissions that would be emitted during the period of the variance.

(b) *Notices and public hearings for variances.* Upon receipt of a variance application containing the information required in subsection (a), the Executive Officer shall hold a public hearing to determine whether, under what conditions, and to what extent, a variance from the requirements in Section 94509 is necessary and will be permitted. A hearing shall be initiated no later than 75 days after receipt of a variance application. Notice of the time and place of the hearing shall be sent to the applicant by certified mail not less than 30 days prior to the hearing. Notice of the hearing shall also be submitted for publication in the California Regulatory Notice Register and sent to every person who requests such notice, not less than 30 days prior to the hearing. The notice shall state that the parties may, but need not be, represented by counsel at the hearing. At least 30 days prior to the hearing, the variance application shall be made available to the public for inspection. Interested members of the public shall be allowed a reasonable opportunity to testify at the hearing and their testimony shall be considered.

(c) *Treatment of confidential information.* Information submitted to the Executive Officer by a variance applicant may be claimed as confidential, and such information shall be handled in accordance with the procedures specified in Title 17, California Code of Regulations, Sections 91000-91022. The Executive Officer may consider such confidential information in reaching a decision on a variance application.

(d) *Necessary findings for granting variances.* No variance shall be granted unless all of the following findings are made:

(1) that, because of reasons beyond the reasonable control of the applicant, requiring compliance with Section 94509 would result in extraordinary economic hardship.

(2) that the public interest in mitigating the extraordinary hardship to the applicant by issuing the variance outweighs the public interest in avoiding any increased emissions of air contaminants which would result from issuing the variance.

(3) that the compliance report proposed by the applicant can reasonably be implemented, and will achieve compliance as expeditiously as possible.

(e) *Variance orders.* Any variance order shall specify a final compliance date by which the requirements of Section 94509 will be achieved. Any variance order shall contain a condition that specifies increments of progress necessary to assure timely compliance, and such other conditions that the Executive Officer, in consideration of the testimony received at the hearing, finds necessary to carry out the purposes of Division 26 of the Health and Safety Code.

(f) *Situations in which variances shall cease to be effective.* A variance shall cease to be effective upon failure of the party to whom the variance was granted to comply with any term or condition of the variance.

(g) *Modification and revocation of variances.* Upon the application of any person, the Executive Officer may review, and for good cause, modify or revoke a variance from requirements of Section 94509 after holding a public hearing in accordance with the provisions of subsection (b).

(h) *Special conditions in variance orders for hairspray products.*

In imposing conditions in variance orders granted from the June 1, 1999, 55 percent VOC standard for hairspray products, the Executive Officer, in addition to any other conditions that may be imposed, shall require the applicant to mitigate the excess VOC emissions that would be emitted during the period of the variance. If this mitigation requirement would result in an extraordinary economic hardship to the applicant, or if other good cause exists, the Executive Officer may waive all or part of this requirement.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

94515. Test Methods.

(a)(1) *VOC content determination using ARB Method 310.* Testing to determine compliance with the requirements of this article, shall be performed using Air Resources Board Method 310, Determination of Volatile Organic Compounds (VOC) in Consumer Products, adopted September 25, 1997 and as last amended on May 5, 2005, which is incorporated herein by reference. Alternative methods which are shown to accurately determine the concentration of VOCs in a subject product or its emissions may be used upon approval of the Executive Officer.

(2) In sections 3.5, 3.6, and 3.7 of Air Resources Board (ARB) Method 310, a process is specified for the "Initial Determination of VOC Content" and the "Final Determination of VOC Content". This process is an integral part of testing procedure set forth in ARB Method 310, and is reproduced below:

Sections 3.5, 3.6, and 3.7 of Air Resources Board Method 310

3.5 *Initial Determination of VOC Content.* The Executive Officer will determine the VOC content pursuant to sections 3.2 and 3.3. Only those components with concentrations equal to or greater than 0.1 percent by weight will be reported.

3.5.1 Using the appropriate formula specified in section 4.0, the Executive Officer will make an initial determination of whether the product meets the applicable VOC standards specified in ARB regulations. If initial results show that the product does not meet the applicable VOC standards, the Executive Officer may perform additional testing to confirm the initial results.

3.5.2 If the results obtained under section 3.5.1 show that the product does not meet the applicable VOC standards, the Executive Officer will request the product manufacturer or responsible party to supply product formulation data. The manufacturer or responsible party shall supply the requested information. Information submitted to the ARB Executive Officer may be claimed as confidential; such information will be handled in accordance with the confidentiality procedures specified in Title 17, California Code of Regulations, sections 91000 to 91022.

3.5.3 If the information supplied by the manufacturer or responsible party shows that the product does not meet the applicable VOC standards, then the Executive Officer will take appropriate enforcement action.

3.5.4 If the manufacturer or responsible party fails to provide formulation data as specified in section 3.5.2, the initial determination of VOC content under this section 3.5 shall determine if the product is in compliance with the applicable VOC standards. This determination may be used to establish a violation of ARB regulations.

3.6 Determination of the LVP-VOC status of compounds and mixtures. This section does not apply to antiperspirant and deodorants or aerosol coating products because there is no LVP-VOC exemption for these products.

3.6.1 Formulation data. If the vapor pressure is unknown, the following ASTM methods may be used to determine the LVP-VOC status of compounds and mixtures: ASTM D 86-01, ASTM D 850-00, ASTM D 1078-01, ASTM D 2879-97, as modified in Appendix B to this Method 310, ASTM D 2887-01 and ASTM E 1719-97.

3.6.2 LVP-VOC status of "compounds" or "mixtures." The Executive Officer will test a sample of the LVP-VOC used in the product formulation to determine the boiling point for a compound or for a mixture. If the boiling point exceeds 216°C, the compound or mixture is an LVP-VOC. If the boiling point is less than 216°C, then the weight percent of the mixture which boils above 216°C is an LVP-VOC. The Executive Officer will use the nearest 5 percent distillation cut that is greater than 216°C as determined under 3.6.1 to determine the percentage of the mixture qualifying as an LVP-VOC.

3.6.3 Reference method for identification of LVP-VOC compounds and mixtures. If a product does not qualify as an LVP-VOC under 3.6.2, the Executive Officer will test a sample of the compound or mixture used in a products formulation utilizing one or both of the following: ASTM D 2879-97, as modified in Appendix B to this Method 310, and ASTM E 1719-97, to determine if the compound or mixture meets the requirements of Title 17, CCR, section 94508(91)(A).

3.7 *Final Determination of VOC Content.* If a product's compliance status is not satisfactorily resolved under sections 3.5 and 3.6, the Executive Officer will conduct further analyses and testing as necessary to verify the formulation data.

3.7.1 If the accuracy of the supplied formulation data is verified and the product sample is determined to meet the applicable VOC standards, then no enforcement action for violation of the VOC standards will be taken.

3.7.2 If the Executive Officer is unable to verify the accuracy of the supplied formulation data, then the Executive Officer will request the product manufacturer or responsible party to supply information to explain the discrepancy.

3.7.3 If there exists a discrepancy that cannot be resolved between the results of Method 310 and the supplied formulation data, then the results of Method 310 shall take precedence over the supplied formulation data. The results of Method 310 shall then determine if the product is in compliance with the applicable VOC standards, and may be used to establish a violation of ARB regulations.

(b) VOC content determinations using product formulation and records. Testing to determine compliance with the requirements of this article may also be demonstrated through calculation of the VOC content from records of the amounts of constituents used to make the product pursuant to the following criteria:

(1) Compliance determinations based on these records may not be used unless the manufacturer of a consumer product keeps accurate records for each day of production of the amount and chemical composition of the individual product constituents. These records must be kept for at least three years.

(2) For the purposes of this section 94515(b), the VOC content shall be calculated according to the following equation:

$$\text{VOC Content} = \frac{B - C}{A} \times 100$$

where,

A = total net weight of unit (excluding container and packaging)

B = total weight of all VOCs, as defined in Section 94508(a), per unit

C = total weight of VOCs exempted under Section 94510, per unit

(3) If product records appear to demonstrate compliance with the VOC limits, but these records are contradicted by product testing performed using ARB Method 310, the results of ARB Method 310 shall take precedence over the product records and may be used to establish a violation of the requirements of this article.

(c) Determination of liquid or solid. Testing to determine whether a product is a liquid or solid shall be performed using ASTM D4359-90, which is incorporated by reference herein.

(d) Compliance determinations for charcoal lighter material products. Testing to determine compliance with the certification requirements for charcoal lighter material shall be performed using the procedures specified in the South Coast Air Quality Management District Rule 1174 Ignition Method Compliance Certification Protocol (February 28, 1991), which is incorporated by reference herein.

(e) Testing to determine distillation points of petroleum distillate-based charcoal lighter materials shall be performed using ASTM D86-01, which is incorporated by reference herein.

(f) Fragrance content determinations for personal fragrance products. Testing to determine the percent by weight of fragrance in personal fragrance products shall be performed according to the Association of Official Analytical Chemists (AOAC) Official Method of Analysis No. 932.11, 1990, "Essential Oil in Flavor Extracts and Toilet Preparations, Babcock Method" (AOAC Official Methods of Analysis, 15th Edition, 1990), which is incorporated by reference herein.

(g) No person shall create, alter, falsify, or otherwise modify records in such a way that the records do not accurately reflect the constituents used to manufacture a product, the chemical composition of the individual product, and any other test, processes, or records used in connection with product manufacture.

NOTE: Authority cited: Sections 39600, 39601, 39607, 41511, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 39607, 40000, 41511, and 41712, Health and Safety Code.

94516. Severability.

Each part of this article shall be deemed severable, and in the event that any part of this article is held to be invalid, the remainder of this article shall continue in full force and effect.

NOTE: Authority cited: Sections 39600, 39601, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 40000, and 41712, Health and Safety Code.

94517. Federal Enforceability.

For purposes of federal enforceability of this article, the Environmental Protection Agency is not subject to approval determinations made by the Executive Officer under Sections 94511, 94514, and 94515. Within 180 days of a request from a person who has been granted an exemption or variance under Section 94511 or 94514, an exemption or variance meeting the requirements of the Clean Air Act shall be submitted by the Executive Officer to the Environmental Protection Agency for inclusion in the applicable implementation plan approved or promulgated by the Environmental Protection Agency pursuant to Section 110 of the Clean Air Act, 42 U.S.C., Section 7410. Prior to submitting an exemption granted under Section 94511 as a revision to the applicable implementation plan, the Executive Officer shall hold a public hearing on the proposed exemption. Notice of the time and place of the hearing shall be sent to the applicant by certified mail not less than 30 days prior to the hearing. Notice of the hearing shall also be submitted for publication in the California Regulatory Notice Register and sent to the Environmental Protection Agency, every person who requests such notice, and to any person or group of persons whom the Executive Officer believes may be interested in the application. Within 30 days of the hearing the Executive Officer shall notify the applicant of the decision in writing as provided in Section 94511(f). The decision may approve, disapprove, or modify an exemption previously granted pursuant to Section 94511.

NOTE: Authority cited: Section 39600, 39601, 39602, and 41712, Health and Safety Code. Reference: Sections 39002, 39600, 39602, 40000, and 41712, Health and Safety Code.

APPENDIX C:
Workgroup Meetings and Workshop Notices

Air Resources Board

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

Alan C. Lloyd, Ph.D.
Agency Secretary

Arnold Schwarzenegger
Governor

December 22, 2005

Dear Sir or Madam:

The California Air Resources Board (ARB/Board) staff invite you to join us via teleconference on Thursday, January 19, 2006, at 9:00 a.m. Pacific Standard Time, to discuss current and upcoming consumer products program activity. This will be the first meeting of the 2006 Consumer Products Regulation Workgroup, a subcommittee of the Consumer Products Working Group.

This workgroup will serve as a forum for communication regarding the development of the consumer product regulations that will be presented to the Board in November 2006. Specifically, we intend to discuss the 2003 Consumer and Commercial Products Survey Preliminary Data Summaries and the schedule for the upcoming rulemaking process.

The most current information about the ARB Consumer Products Program, including the 2003 Consumer and Commercial Products Survey Preliminary Data Summaries, can be found at the following website: http://www.arb.ca.gov/consprod/consprod.htm. From this site you may also sign up for the Consumer Products Program list serve, which will send you an email notice when new information is posted to the consumer products website about any of the consumer product program activities. The agenda for the workgroup meeting will be posted to this website prior to the meeting, and notification will be sent via the list serve when it is posted.

We look forward to your participation in the upcoming regulatory process. We plan to hold the meeting at the Cal/EPA Headquarters Building, 1001 I Street, Sierra Hearing Room, in Sacramento, California. You may attend in person or participate via teleconference. The following information is needed to participate via teleconference:

Date and Time:	Thursday, January 19 at 9:00 a.m. (PST)
Call-in Time:	Between 8:45 a.m. and 9:00 a.m.
Toll Free Number:	(888) 316-9406 (U. S. callers)
Toll Number:	+1-210-839-8502 (International callers)
Passcode:	5528337
Leader:	Trish Johnson

Please note that you do not need to notify us if you plan to participate via teleconference, however, if you choose to attend in person, please contact

Ms. Trish Johnson at tjohnson@arb.ca.gov to verify seating availability. Please provide your affiliation, phone number, and number of people attending in the email.

During the last 15 years, regulation of consumer products has resulted in a significant reduction in volatile organic compound emissions from consumer products. However, in order to meet air quality goals, significant further reductions from consumer products are needed. The regulations will be developed primarily based on information received from the 2003 Consumer & Commercial Products Survey. The goal of new consumer products emission standards, to be adopted in 2006, is to achieve a minimum emission reduction of 10-15 tons per day starting in 2008. Reductions will be achieved by setting mass-based and possibly reactivity-based standards.

If you have any questions about this letter or the regulatory development process, please contact Mr. David Mallory, Manager, Measures Development Section, at (916) 445-8316, or by e-mail at dmallory@arb.ca.gov.

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 need 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. TTY/TDD/Speech/to/Speech users may dial 711 for the California Relay Service.

Sincerely,

Janette Brooks, Chief
Air Quality Measures Branch
Stationary Source Division

cc: See next page.

cc: David Mallory, Manager
Measures Development Section
Air Quality Measures Branch

Trish Johnson
Air Pollution Specialist
Measures Development Section

Debbie Sanchez
ADA Coordinator
Administrative Services Division

Linda Harvey
Bilingual Coordinator
Administrative Services Division

2006 Consumer Products Regulation Workgroup

Meeting Agenda
Thursday, January 19, 2006

Time: 9:00 a.m. (PST)
Toll Free Number: (888) 316-9406
Passcode: 5528337
Leader: Trish Johnson

1. Introductions
2. Background
3. 2003 Consumer & Commercial Products Survey
   - Data Summaries
4. 2005 Commercial & Commercial Products Survey
5. Other Consumer Products Activities
6. State Implementation Plan
7. 2006 Regulatory Amendments

California Environmental Protection Agency
AIR RESOURCES BOARD

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Alan C. Lloyd, Ph.D.
Agency Secretary

Arnold Schwarzenegger
Governor

March 2, 2006

Dear Sir or Madam:

The California Air Resources Board (ARB) staff invite you to join us on Monday, March 27, 2006, at 1:00 p.m. (PST) for a meeting of the Consumer Products Workgroup. This is the second meeting regarding the development of consumer products regulations that will be presented to ARB in November 2006. Specifically, we intend to discuss additions and adjustments made to the 2003 Consumer and Commercial Products Survey Preliminary Data Summaries. We also intend to discuss a draft initial list of categories proposed for regulation. The agenda and other materials for the workgroup meeting will be posted to the website listed below prior to the meeting, and notification will be sent via the list serve when it is posted.

We look forward to your participation in the upcoming regulatory process. We plan to hold the meeting at the Cal/EPA Headquarters Building, 1001 I Street, Coastal Hearing Room, in Sacramento, California. You may attend in person or participate via teleconference. The following information is needed to participate via teleconference:

Date and Time:	Monday, March 27 at 1:00 p.m. (PST)
Call-in Time:	Between 12:45 p.m. and 1:00 p.m.
Toll Free Number:	(888) 790-4592 (U.S. callers)
Toll Number:	+1-773-681-5936 (International callers)
Passcode:	4841573
Leader:	Trish Johnson

If you choose to attend in person, please contact Ms. Trish Johnson by email at tjohnson@arb.ca.gov to verify seating availability. In the email please provide your affiliation, phone number, and number of people attending.

The most current information available on ARB Consumer Products Program, including the 2003 Consumer and Commercial Products Survey Preliminary Data Summaries, can be found at the following website: http://www.arb.ca.gov/consprod/consprod.htm. From this site you can sign up for the Consumer Products Program list serve, which will send you an email notice when any new information is posted to the consumer products website.

If you have any questions about this letter or the regulatory development process, please contact Mr. David Mallory, Manager, Measures Development Section, at (916) 445-8316, or by email at dmallory@arb.ca.gov.

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 need 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. TTY/TDD/Speech/to/Speech users may dial 711 for the California Relay Service.

Sincerely,

Janette Brooks, Chief
Air Quality Measures Branch
Stationary Source Division

cc: David Mallory, Manager
Measures Development Section
Air Quality Measures Branch

Debbie Sanchez
ADA Coordinator
Administrative Services Division

Linda Harvey
Bilingual Coordinator
Administrative Services Division

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Dan Skopec
Acting Secretary

Arnold Schwarzenegger
Governor

May 9, 2006

Dear Sir or Madam:

The California Air Resources Board (ARB or Board) invites you to join us Thursday, June 1, 2006, in Sacramento, California for a meeting of the Consumer Products Workgroup. This will be the third meeting regarding the development of the consumer products regulations that will be presented to the Board in November 2006. We will be discussing draft regulatory categories and initial draft proposed volatile organic compound (VOC) limits, and other agenda items related to the next regulatory effort.

We plan to hold this meeting at ARB's Monitoring and Laboratory Division Building, 1927 13th Street, Conference Room, in Sacramento. You may attend in person or participate via teleconference. The following information is needed to participate via teleconference:

Date and Time:	**Thursday, June 1, at 9:00 a.m. (PDT)**
Call-in Time:	**Between 8:45 a.m. and 9:00 a.m.**
USA Toll Free Number:	**888-462-1974**
Passcode:	**Consumer Products**
Leader:	**Trish Johnson**

Please note that you do not need to notify us if you plan to participate via teleconference, however, if you choose to attend in person, please contact Ms. Trish Johnson by e-mail at tjohnson@arb.ca.gov to verify seating availability, no later than Friday, May 26. In the e-mail, please provide your company name, phone number, and number of people attending.

Approximately one week prior to the workgroup meeting we expect to post at the consumer products website http://www.arb.ca.gov/consprod/regact/cpwg2006/cpwg2006.htm, an agenda, the draft regulatory categories, and initial draft proposed VOC limits. Once these items have been posted, a List Serve e-mail will be sent to subscribers announcing that the handouts have been posted. We will provide an opportunity to discuss these materials at the workgroup meeting. If you have not done so already, you can subscribe to the Consumer Products Program List Serve at http://www.arb.ca.gov/listserv/consumer-products/consumer-products.htm.

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

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Sir or Madam

Page 2

We look forward to your participation in the workgroup process. If you have any questions about this letter or the regulatory development process, please contact Mr. David Mallory, Manager, Measures Development Section, at (916) 445-8316, or by e-mail at dmallory@arb.ca.gov. TTY/TDD/Speech/to/Speech users may dial 711 for the California Relay Service. To obtain a copy of this document in an alternative format or if you have special accommodation needs, please contact the ADA Coordinator at (916) 323-4916.

Sincerely,

Janette Brooks, Chief
Air Quality Measures Branch
Stationary Source Division

Attachment

cc: David Mallory, Manager
Measures Development Section
Air Quality Measures Branch

Trish Johnson
Measures Development Section
Air Quality Measures Branch

Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

July 6, 2006

Dear Sir or Madam:

The California Air Resources Board (ARB or Board) invites you to join us Tuesday, July 25, 2006, in Sacramento, California for a meeting of the Consumer Products Workgroup. This will be the fourth meeting regarding the development of the consumer products regulations that will be presented to the Board in November 2006. We will be discussing proposed category definitions and volatile organic compound limits, the proposed regulatory changes, and other topics related to the next regulatory effort.

We plan to hold this meeting at the Cal/EPA Headquarters Building, 1001 I Street, Sierra Hearing Room, in Sacramento. You may attend in person or participate via teleconference. The following information is needed to participate via teleconference:

Date and Time:	**Tuesday, July 25, at 9:00 a.m. (PDT)**
Call-in Time:	**Between 8:45 a.m. and 9:00 a.m.**
USA Toll Free Number:	**800-857-7003**
Toll Number:	**+1-210-234-0001** (International Callers)
Passcode:	**Consumer Products**
Leader:	**Trish Johnson**

Please note that you do not need to notify us if you plan to participate via teleconference, however, if you choose to attend in person, please contact Ms. Trish Johnson by e-mail at tjohnson@arb.ca.gov to verify seating availability, no later than Friday, July 21. In the e-mail, please provide your company name, phone number, and number of people attending.

Approximately one week prior to the workgroup meeting we expect to post at the consumer products website http://www.arb.ca.gov/consprod/regact/cpwg2006/cpwg2006.htm, an agenda, a list of updated proposed category standards, initial draft definitions, and other regulatory changes. Once these items have been posted, a List Serve e-mail will be sent to subscribers announcing that the handouts have been posted. We will provide an opportunity to discuss these materials at the workgroup meeting. If you have not done so already, you can subscribe to the Consumer Products Program List Serve at http://www.arb.ca.gov/listserv/consumer-products.htm.

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.

We look forward to your participation in the workgroup process. If you have any questions about this letter or the regulatory development process, please contact Mr. David Mallory, Manager, Measures Development Section, at (916) 445-8316, or by e-mail at dmallory@arb.ca.gov. For individuals with sensory disabilities, this document is available in Braille, large print, audio cassette or computer disk. Please contact ARB's Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at 916-323-7053.

Sincerely,

Janette Brooks, Chief
Air Quality Measures Branch
Stationary Source Division

cc: David Mallory, Manager
Measures Development Section
Air Quality Measures Branch

Trish Johnson
Measures Development Section
Air Quality Measures Branch

Linda S. Adams
Secretary for
Environmental Protection

Air Resources Board

Robert F. Sawyer, Ph.D., Chair
1001 I Street • P.O. Box 2815
Sacramento, California 95812 • www.arb.ca.gov

Arnold Schwarzenegger
Governor

August 25, 2006

Dear Sir or Madam:

The Air Resources Board (ARB or Board) invites you to participate in a public workshop to discuss the development of proposed modifications to the consumer products regulations. These proposed modifications are consistent with ARB's State Implementation Plan for Ozone and are necessary to help California meet its commitment to attain ambient air quality standards. At this workshop we will discuss staff's proposed regulatory language modifications and proposed new volatile organic compound (VOC) limits for specific categories of consumer products. We will provide you with background information, receive questions, and welcome your comments on our proposals. Approximately one week prior to the workshop, we plan to post a "strike-out/underline" version of the consumer products regulation to our website (see address below) which will contain all proposed modified language and new VOC limits.

We plan to hold this meeting at ARB's Monitoring and Laboratory Division Building, 1927 13th Street, Conference Room, in Sacramento. You may attend in person or participate via teleconference. The following information is needed to participate via teleconference:

Date and Time:	**Thursday, Sept. 14, at 9:00 a.m. (PDT)**
Call-in Time:	**Between 8:45 a.m. and 9:00 a.m.**
USA Toll Free Number:	**800-369-1850**
Toll Number:	**+1-210-234-0010** (International Callers)
Passcode:	**Consumer Products**
Leader:	**Trish Johnson**

You can find additional information on the workshop, staff's latest proposal for modifications to the consumer products regulations, and the staff's workshop presentation at the website http://www.arb.ca.gov/consprod/regact/cpwg2006/cpwg2006.htm.
This website will be updated regularly with information pertinent to this workshop. Attendees should check this website prior to attending to keep updated on substantive information about this workshop. If you wish to receive e-mail notification of updates on the workshop and ARB's Consumer Products Program, please register for our Consumer Products list serve at http://www.arb.ca.gov/listserv/consumer-products.htm.

We look forward to your participation in the workgroup process. If you have any questions about this letter or the regulatory development process, please contact Mr. David Mallory, Manager, Measures Development Section, at (916) 445-8316, or by e-mail at dmallory@arb.ca.gov. For individuals with sensory disabilities, this document is available in Braille, large print, audio cassette or computer disk. Please contact ARB's Disability Coordinator at 916-323-4916 by voice or through the California Relay Services at 711, to place your request for disability services. If you are a person with limited English and would like to request interpreter services, please contact ARB's Bilingual Manager at 916-323-7053.

Sincerely,

Janette Brooks, Chief
Air Quality Measures Branch
Stationary Source Division

cc: David Mallory, Manager
Measures Development Section
Air Quality Measures Branch

Trish Johnson
Measures Development Section
Air Quality Measures Branch

APPENDIX D:
2003 Consumer and Commercial Products Survey

PART I:
Responsible Party Identification

PRELIMINARY FORM: WHO MUST COMPLETE THE 2003 SURVEY?

Instructions: Upon receipt of this survey packet, you must immediately complete and submit this page to ARB, **no later than November 24, 2004**. Read the following definition of *Responsible Party*, carefully review the list of product categories covered by this survey (Attachment A), and respond to items 1-3 below.

*For the purpose of this survey, the "**responsible party**" means the company, firm, or establishment listed on the label of a consumer or commercial product reportable under this survey that was sold with intention for use in California during Calendar Year 2003. If the label lists two companies, firms, or establishments, the responsible party is the party that the product was "manufactured for" or "distributed by," as noted on the label.*

1. Are you a *responsible party*? Check (✔) "Yes" or "No"

❑ **Yes.** My company is a *responsible party* and will be submitting a 2003 survey, as required by California State Law.

(optional) Check (✔) the following box to request the CD containing the electronic version of the survey forms for *responsible parties* (see page III-8 for more information).
❑ **Please send the CD for Responsible Parties to the address below.**

❑ **No.** My company is not a *responsible party* and will not be submitting a 2003 survey because:

Check (✔) one:

❑ My company is a *formulator* only, not a *responsible party*, and will complete FORM 4 when requested by *responsible parties*. (For the purposes of this survey, *formulator* means any company, other than the *responsible party*, that holds the ingredient information for a product.)

(optional) Check (✔) the following box to request the CD containing the electronic version of FORM 4 (Ingredient Information) for formulators (see page III-8 for more information).
❑ **Please send the CD for Formulators to the address below.**

❑ My company is not responsible for any products reportable for the 2003 survey, but is responsible for products that are proposed for the next survey (for Calendar Year 2005).

❑ My company, firm or establishment does not sell, supply, offer for sale, or manufacture *consumer products* for use in the state of California.

❑ Other, please explain: _____

2. Complete the following information:

Your Company Name:_____ Website:_____

Address:_____

City:_____ State:_____ Zip:_____

Contact Person:_____ Title:_____

Phone:_____ Fax:_____ Email:_____

Authorized Signature:_____ ***Date:***_____

3. By November 24, 2004, send this page by fax to (916) 327-5621, *or* cut and fold this page as indicated, apply required postage, and mail to the address on the back of this page.

For questions about this page, contact Jessica Dean at (916) 322-2362 or by e-mail at jdean@arb.ca.gov

cut here or photocopy this page and submit immediately upon receipt

Postage required

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
Attn: SSD, Measures Development Section, 2003 Survey

Fold Here

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PART II:
Survey Introduction

OVERVIEW

This section provides background about how the 2003 Consumer & Commercial Products Survey (survey) relates to the Consumer Products Program and the purpose and goals of the survey.

Background

The information requested in this survey is made pursuant to sections 39600, 39607, 39701, and 41511 of the California Health and Safety Code (HSC), and sections 91100 and 94513, Title 17, of the California Code of Regulations (CCR). These sections authorize the California Air Resources Board (ARB, Board) to require the submission of information needed by the Board to estimate atmospheric emissions and to carry out its other statutory duties. Associated laws and regulations may be found at the following website: www.arb.ca.gov/html/lawsregs.htm.

The Consumer Products Program is an important part of the ARB's overall effort to reduce emissions from the use of consumer products in homes and institutions. Section 41712 of the California Health and Safety Code requires the ARB to adopt regulations that achieve the maximum feasible reduction in *volatile organic compound (VOC)* emissions from consumer products. *VOCs* that are emitted from consumer products react with other pollutants in the presence of sunlight to form ground-level ozone and particulate matter, which are the main ingredients of smog.

California's State Implementation Plan (SIP) for ozone serves as California's overall long-term plan for attainment of the federal ozone standards. In the SIP, the ARB has committed to achieving significant emission reductions from consumer products. To help achieve these reductions, *VOC* standards have been developed for about 100 consumer product categories, which have resulted in considerable reductions of emissions from consumer products during the last ten years. However, after the latest standards are implemented, emissions will begin to increase from consumer products due to population growth. Therefore, additional control measures are necessary so that this emissions growth will not overtake the reductions already achieved. As part of the regulatory process, the ARB must determine that adequate data exists to adopt regulations. This survey is a primary step in gathering the data. Additionally, section 41712(c) of the California Health and Safety Code stipulates that no regulation shall be adopted which requires the elimination of a product form.

Purpose & Goals

The purpose of this survey is to gather current information on *volatile organic compound (VOC)* emissions from consumer and commercial product categories. The survey has two goals: first, to update our consumer products emissions inventory; and second, to assist us in determining the feasibility of further reducing consumer products emissions. Please note that all categories surveyed will not necessarily be regulated; regulation will occur only in cases where new *VOC* limits are determined to be commercially and technologically feasible.

Purpose: **to gather current information on *VOC* emissions from consumer product categories**

SURVEY DEVELOPMENT

The following section provides information about how the survey was developed and describes how this survey differs from the last survey, the 2001 Consumer and Commercial Products Survey (2001 Survey).

Workgroup Formed

The ARB sent over 3,500 invitation letters to potential consumer product stakeholders to help establish the 2003 Survey Stakeholder Workgroup (Workgroup), a subcommittee of the Consumer Products Workgroup. The Workgroup served as a forum for on-going communication between the ARB and stakeholders regarding the development of the survey. Ultimately, over 70 stakeholders, including representatives from industry, environmental groups, concerned citizens, and government agencies, actively participated in the development of this survey.

Over 70 stakeholders helped the ARB develop this survey.

Two Workgroup meetings were held and were open to the public. They were announced via the Workgroup mailing list and the consumer product list-server. The meetings offered participation by teleconference or in-person and written comments were taken in the weeks following each meeting. The Workgroup meetings were held as follows:

- **August 25, 2004** – This initial meeting introduced the ARB Consumer Products Program, the goals of the 2003 survey, and the expected timeline for the survey process. The draft comprehensive list of survey categories was released one week before the meeting. Along with the survey categories, proposed changes to the survey forms (since the 2001 survey) were presented and discussed.
- **September 30, 2004** – ARB released a preliminary draft of the 2003 Survey approximately one week before the meeting. A revised list of proposed survey categories was also released, based on comments from the previous meeting. ARB staff reviewed comments from the August 25th meeting and discussed the draft survey packet, including identification of the proposed changes to the survey forms since the 2001 Survey. Stakeholders provided comments concerning the revised survey category list and the draft survey packet.

We would like to thank Workgroup participants that assisted us over the last several months in developing this survey. Special thanks to the Cosmetic, Toiletry, and Fragrance Association (CTFA), Consumer Specialty Products Association (CSPA), International Sanitary Supply Association, Inc. (ISSA), National Paint & Coatings Association (NPCA), and the Automotive Specialty Products Alliance (ASPA). We also want to thank the numerous individuals not specifically listed here that provided valuable insight and comments during the survey development process. The survey, which has been greatly improved as a result of input from the Workgroup, reflects those considerations.

Updates Since the 2001 Survey

This survey was developed using the ARB 2001 Consumer & Commercial Products Survey (2001 Survey) as a starting point. Following is a list of updates since the last survey and some notes of clarification.

Updates:

- **Comprehensive Category List.** *First survey on this scale performed by ARB; see Attachment A*
- **List of Low Vapor Pressure VOCs (LVP-VOCs) to be Individually Reported.** *List helps determine which LVP-VOCs to list individually on FORM 4; see Attachment E*
- **Hydrocarbon Solvent Information.** *Contains samples of trade names and bin numbers to assist in completion of FORM 4; see Attachment F*
- **Addition of Specific Ingredients.** *Aminomethylpropanol (AMP), HFC-134a, and HCFC-141b; see FORM 4*
- **Product "forms" Question Revised.** *Designed to capture more detail about packaging methods and dispensed product forms; see FORM 3*
- **Reporting of Sales Data.** *Sales to be reported by number of units; "method" of data collection added; reporting of filled product, including "overfill" added; clarification in instructions that internet sales must be reported; see FORM 3*
- **Resin/polymer/film-forming compounds.** *Addition of "Does this product contain a resin, polymer, or other film-forming compound?" question; see FORM 3*
- **Special Reporting Requirements for Aerosol Adhesives.** *Supplement to the survey that applies to Aerosol Adhesives only; fulfills special reporting requirements for Aerosol Adhesives; see Part VIII of the survey*
- **Certification, Authorized Signature.** *Signature required from management level, authorized representative; see FORM 1*
- **Electronic Version of Survey and Various Instructions for Formulators.** *For formulating companies submitting ingredient information on behalf of a responsible party, there is now the option to use an electronic version of FORM 4; throughout the survey packet, instructions specific to formulators have been added; see page III-2*
- **CAS list posted to survey website.** *For those unable to obtain the Chemical Abstract Service (CAS) number for an ingredient from their supplier, they can visit the survey website (www.arb.ca.gov/consprod/regact/2003surv/2003surv.htm) for links to the ARB's Consumer Products CAS list. See page III-11 for other chemistry websites.*

Notes of Clarification:

- **Product group criteria:** *products with two percent or more variation in VOC content cannot be grouped; formulas must be examined carefully prior to grouping, especially products with multiple shades (e.g. nail coatings); grouping by herbal/botanical extracts is acceptable if products also meet other grouping criteria.*
- **Reporting is mandatory:** *responsible parties, formulators, and any other company holding data requested by the survey are required by law to report.*

PART III:
Before You Begin...

GUIDELINES FOR COMPLETING THE SURVEY

This section provides an overview of particular items on the forms and provides guidelines for filling out and completing the survey. Before you begin filling out the survey forms, please carefully read through these guidelines and the instructions on the back of the forms. **Note: use only the 2003 survey forms in this packet; do not use any previous consumer product survey forms.**

Who Must Complete the Survey?

Each *responsible party* must complete the entire survey. For the purpose of this survey, the "*responsible party*" means the company, firm, or establishment listed on the label of a consumer or commercial product reportable under this survey (see survey categories in Attachment A, and "Types of Products to Report...and Not Report" on page III-3) that was sold with intention for use in California during Calendar Year 2003. If the label lists two companies, firms, or establishments, the responsible party is the party that the product was "manufactured for" or "distributed by," as noted on the label.

If you are a *responsible party* for any product reportable under this survey (see survey categories, Attachment A), this survey is mandatory and must be submitted to the ARB by March 15, 2005. Companies that do not return a completed survey by the due date, will have violated state regulations, and will be referred to the ARB's Enforcement Division for appropriate enforcement action.

The survey must be received from both the *responsible party* and *formulator* by

March 15, 2005.

For the purposes of this survey, the "*formulator*" means a company/person, other than the *responsible party*, that holds the ingredient information for a product. Because many *responsible parties* do not hold their own formulas, it is expected that many *formulators* will be submitting product ingredient information directly to the ARB. FORM 2 has been provided for *responsible parties* to identify *formulators* submitting ingredient information on behalf of their company. If you are using a *formulator*, you need to send the copy of the ingredient form (FORM 4) to your *formulator* in a timely manner to allow completion before the due date. The *responsible party* is ultimately responsible for ensuring all survey data are submitted to the ARB by the due date.

The *formulator's* primary responsibility is to complete FORM 4(s) on behalf of a *responsible party*, after the *responsible party* forwards the FORM 4(s) to the *formulator*. Per California State Law, *formulators* are required to submit this data to the ARB. *Formulators* are encouraged to become familiar with the survey packet and the types of data requested, in preparation for completing their portion of the survey.

The completed survey must be received by the ARB from both the *responsible party* and the *formulator* by March 15, 2005.

Designation of Confidential Information

State law protects the confidentiality of trade secrets (title 17, CCR, sections 91000-91022). The Confidential Information Form on page IV-2 provides a summary of these regulations and the full citation of these sections is provided in Attachment B. The ARB has many years of experience in handling confidential information and takes its responsibilities very seriously. All confidential information will be kept in designated, locked file cabinets and will only be accessible to authorized ARB staff on an "as needed" basis.

If you wish to designate information as confidential, fill out the Confidential Information Form on page IV-2 and check the confidential box on each form as described. The confidential boxes, like the one shown to the left, are located in the upper left-hand corner of all forms. All information that is designated as confidential will be handled in strict accordance with ARB confidentiality regulations and policies.

Check (✔) if Confidential ❑

Types of Products to Report... and not to Report

This survey is intended to collect information about chemically formulated *consumer* and *commercial products* used by households and institutions (such as commercial, service, and government establishments), and products used by industrial entities for the maintenance or operation of their facilities. Reportable under this survey are products sold with intention for use in California, during Calendar Year 2003. This survey is not intended to collect information about *industrial products* used exclusively for on-site manufacture or construction of goods or commodities, with the exception of thinners, reducers, and industrial aerosol adhesives. Please note, products that do not contain *VOCs* must be still be reported.

Prescription-only drugs are not covered by this survey and do not need to be reported. However, for the purposes of this survey, over-the-counter drugs (OTC), anti-microbial, and health benefit products must be reported. While *pet care products* are consumer products that must also be reported, please note that only *pet care products* that fall under categories included in Attachment A need to be reported; all other *pet care products* are planned to be included in the 2005 Survey, which will take place in 2006.

The comprehensive list of product categories covered by this survey has been provided in Attachment A. Please note that although the category list is comprehensive, selected products are proposed for the next survey, which will take place in 2006 for Calendar Year 2005 sales.

The following is a list of products and product types not to report (italicized terms are defined in Part VII):

- ***Aerosol Coating Products*** (will be surveyed for 2005)
- ***Agricultural use products***
- ***Architectural Coatings***
- ***Articles***
- ***Brake fluid***
- ***Commercial Dry Cleaning Fluids***
- **Drugs intended for ingestion**
- ***Fuel Additives***
- ***Furniture Coatings, other paint products***
- ***Industrial products*** **used exclusively for on-site manufacture or construction of goods or commodities**
- ***Laboratory Reagents***
- **Non-Aerosol Adhesives that weigh more than one pound and consist of more than 16 fluid ounces**
- **Non-Aerosol *Undercoatings***
- **Pesticide products that are restricted materials and that require a permit for use and possession**
- **Prescription-only drugs**
- **Refrigerants**
- **Sealants and caulking compounds that weigh more than one pound and consist of more than 16 fluid ounces**
- **Categories designated for 2005 Survey (will take place in 2006); look for "****" survey code designations on the product category list (Attachment A)**

Survey Definitions

To help you complete the survey, many definitions have been included in the survey packet (see Part VII).

Definitions for Bolded Categories. The definitions for the bolded categories in the category list, which are ARB defined categories, have been included, beginning on page VII-2. These definitions should not be used as a basis for deciding to report or not report a product. Products that do not fall into a defined category are likely required to be reported under a different category code. *Please note that some definitions are in strikeout/underline format, which reflects changes from the recent 2004 Consumer Products Regulation Amendments that have not yet been approved by the California Office of Administrative Law (OAL).*

Related Definitions. To help clarify italicized terms used throughout the survey, many related definitions have been provided, beginning on page VII-18. Many of these definitions were developed for survey purposes and are intended for survey purposes only. *Please note that some definitions are in strikeout/underline format, which reflects changes from the recent 2004 Consumer Products Regulation Amendments that have not yet been approved by the California Office of Administrative Law (OAL).*

Reporting Products

This section provides instruction on how to report specific products and keep track of multiple products when submitting the survey.

Locating Categories and Codes on the List. A list of the survey categories with their respective ARB survey codes has been provided in Attachment A. On FORM 3, Item 3 "Primary Category Code," you must enter the category code from this list that best describes your product according to the product's *principal display panel.*

The following steps will help guide you through the category list, help you determine which categories your products fall under, and how to choose the category codes for your reportable products.

1) Review guidelines.
Review the guidelines on page III-3 for which products need to be reported and not reported.

2) Browse the list.
Browse the entire category list, Attachment A, to get an idea for where your products will fall. *Take note of the list organization, including the major market sectors and major product headings, which should guide you through the list.*

3) Locate the product category that best describes your product.
Once you have narrowed your choices down to a major product category, look for the specific category in the list that best describes your product. If you have experience with the Consumer Products Regulation, you may know that your product falls into a defined and/or regulated category. If this is the case, choose that category for your product. If you are unsure, or know that your product does not fall into a defined and/or regulated category, choose the category that best describes your product.

Note: The bolded categories are defined in the Consumer Products Regulation and the definitions can be found in Part VII.

Continued....

4) Assess if your product is reportable for this survey.
Look to the left of the category title you've chosen in Attachment A to see if the product is reportable for the 2003 survey. If a 5-digit code is present, the product **is** reportable. If asterisks are present (***), then you do not need to report the product for this survey; it is proposed for the next survey effort, which will take place in 2006 for Calendar Year 2005 sales.

5) List the product's category code on FORM 3.
For reportable products, list the 5-digit category code under item 3 on FORM 3. See the next item concerning products that fall under more than one category code.

Multiple Categories Codes. There is space on Form 3, item 3, for listing additional category codes for products that fit into more than one survey category according to their *principal display panel.* The "Additional Category Codes" field has been included in this survey because of the unique products being surveyed that have multiple-use claims listed on their *principal display panel.* If your product fits into more than one category, you should list these additional category codes.

For example: a 3-in-1 nail product that is a nail polish primarily, but also has topcoat and base coat claims listed on the *principal display panel*, would require three different category codes: a primary category code of 30906 for nail polish, and the additional category codes of 30911 for topcoat, and 30903 for base coat/undercoat.

Grouping of Products. Rather than reporting very similar products multiple times, a single *product group* may be reported. If a group of products meets the requirements for grouping as defined below, only one FORM 3 and one FORM 4 is required for that *product group*. Note that products with more than two percent variation in VOC content cannot be grouped. Also note that if your products meet the criteria for grouping, and you do report products as a group, you will need to list the details of the group on the Supplement to FORM 3.

Product Group means a group of products represented together for the purposes of this survey that differ only by size, color, botanical/herbal extract, and/or *fragrance*, and meet all of the following grouping requirements:

1) All products must have the same Category Code(s);
2) All products must be the same dispensed form (e.g. liquid, solid, mist/dispersed spray etc., from the choices in item 6 on FORM 3); and
3) Grouped products must have no greater than two percent variation in total VOC content, where the difference is only due to the type or amount of *fragrance*, colorant, or botanical/herbal extracts.

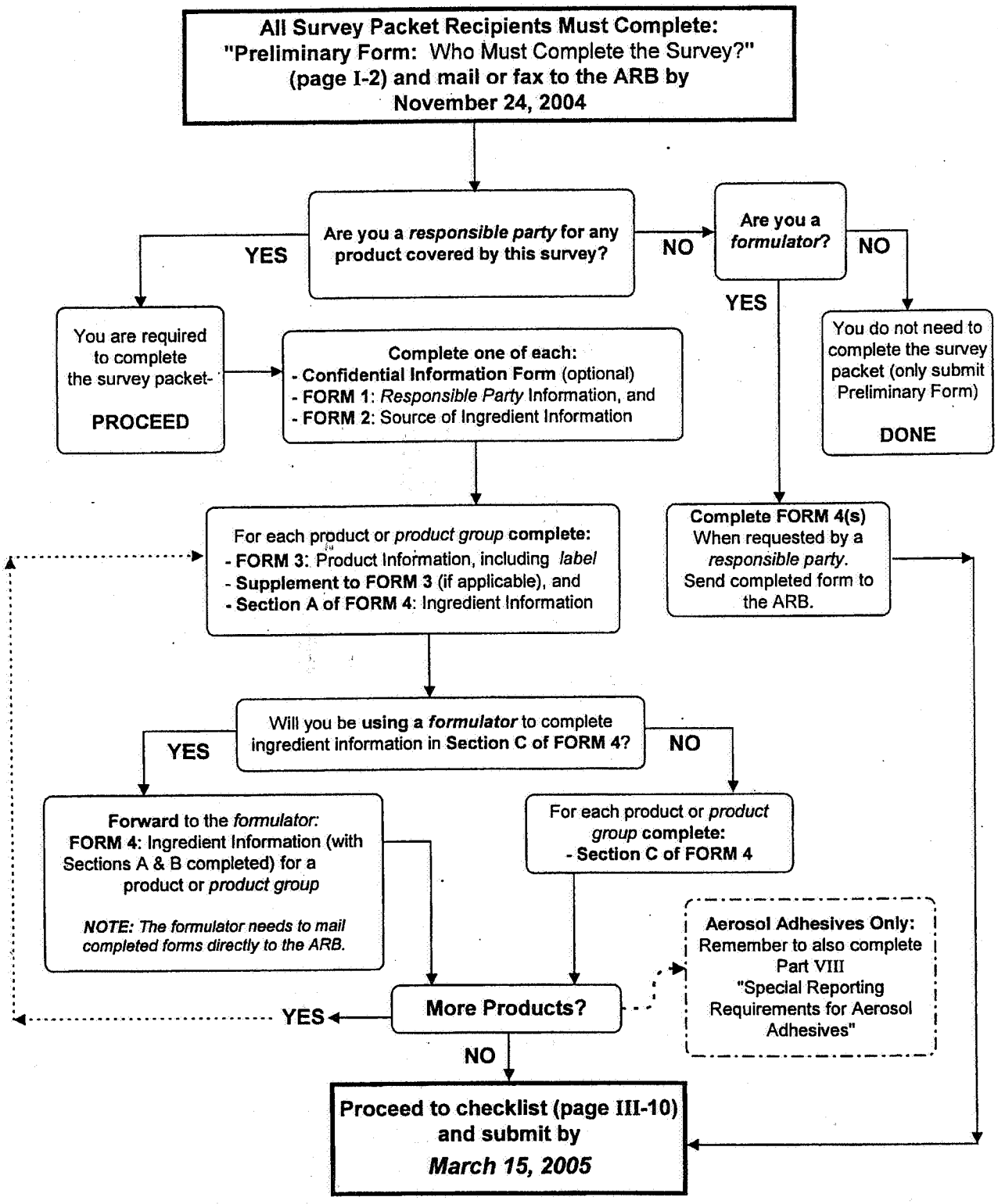
Using Product Tracking Numbers. For each product or *product group*, a "product tracking number" must be assigned by the *responsible party* to associate all related forms and *labels* that provide data for each product or *product group*. The *responsible party* must assign a sequential (1,2,3,4...) tracking number for each product or *product group* submitted. The number should then be entered into the "Product Tracking #" box, like the one shown to the right, which is located in the upper right corner of FORM 3, the Supplement to FORM 3, and FORM 4.

Product Tracking #: _____

For example: the first product submitted will have a "1" written into the "Product Tracking #" box on both FORM 3 and FORM 4 for that product; the second product will have a "2" in the "Product Tracking #" box on both FORM 3 and FORM 4; and so on. This tracking number is also used on FORM 2, the Supplement to FORM 3, and to identify the label.

Flowchart for Completing the Survey

This flowchart has been provided as an aid to guide respondents in completing this survey. Respondents can use this chart to ensure that they understand the steps in completing survey forms.



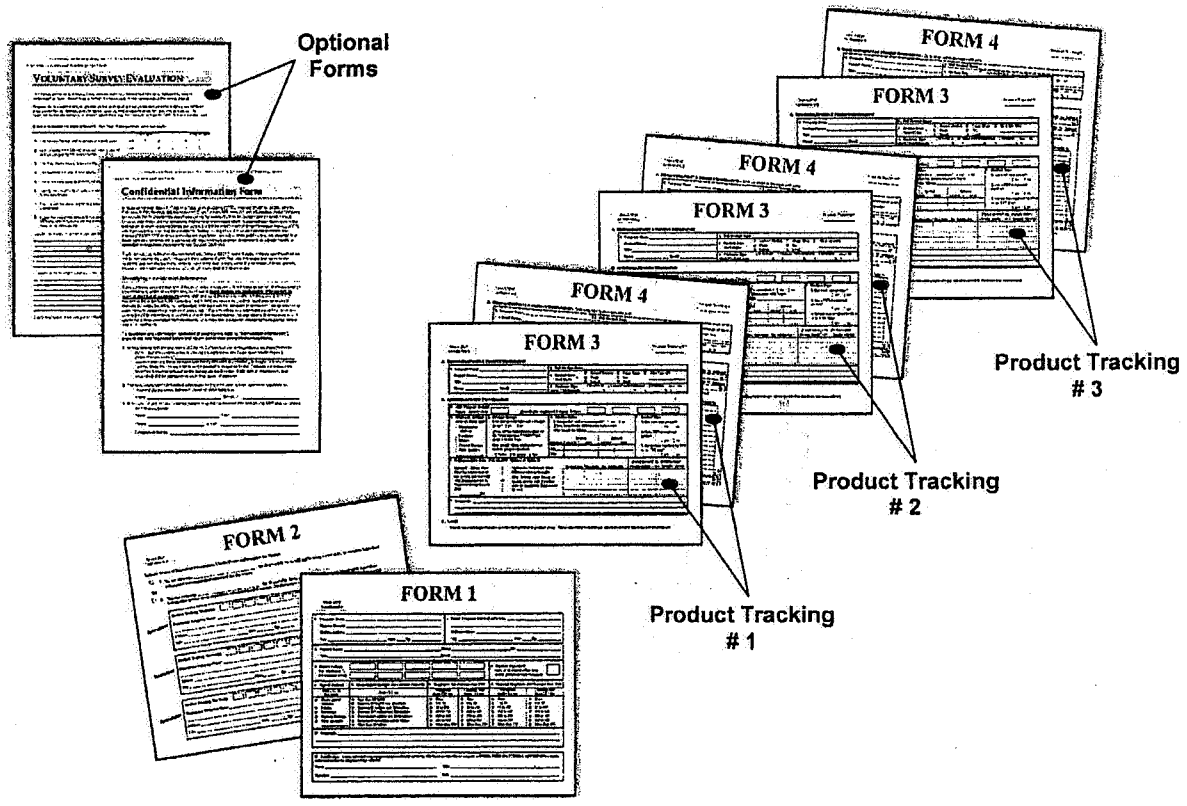
SUBMITTING THE COMPLETED SURVEY

This section provides details about the two options to complete and submit the survey (hardcopy and electronic options), how to submit the survey once complete, and how to submit product *labels*. Choose only one submission option, either the hardcopy option or the electronic option as described below. A checklist is also provided to reference before mailing the survey back to ARB.

Hardcopy Option

Hardcopy versions of the survey forms are available to *responsible parties* and *formulators*. The forms may be typed or filled out by hand. Once completed, mail the hardcopies to one of the addresses listed below in the "Mailing" section.

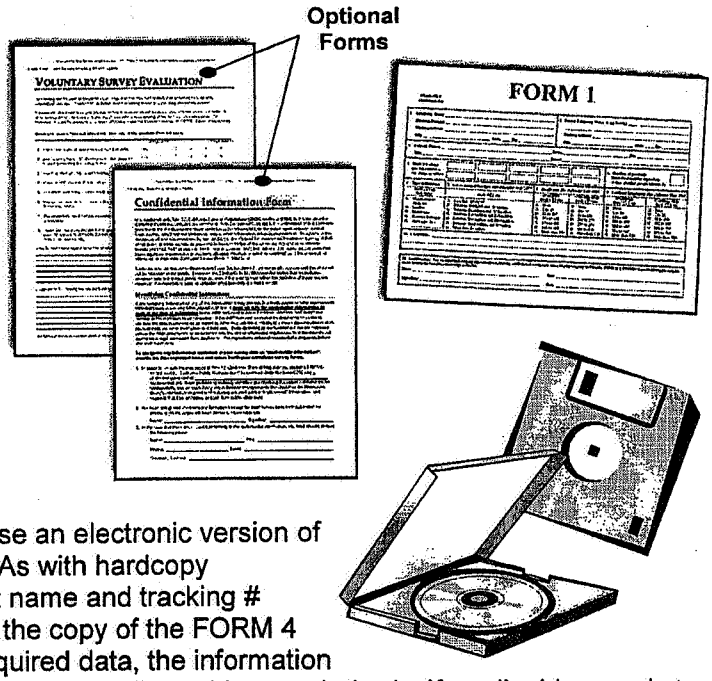
Responsible Parties: When mailing hardcopies, assemble the forms in such a way as to keep related forms together, as shown in the example below.



Formulators: If you will be submitting ingredient information (FORM 4(s)) on behalf of a *responsible party*, after the *responsible party* has forwarded hardcopy FORM 4(s) to you, you will need to complete Section C, the ingredient portion of the form(s), and then mail the form(s) to the ARB. Note that the *responsible party* is required to provide the full product name and tracking # on the FORM 4(s) before sending them to you. Ensure that you identify the full product name and tracking # as chosen by the *responsible party* prior to submitting FORM 4(s) to the ARB. These important items allow ARB staff to link your ingredient information to corresponding product information that the *responsible party* will be submitting.

Electronic Option

Two interactive electronic versions of the survey, one for *responsible parties* and one for *formulators*, are being offered to assist you in filling out the forms. To save time, the electronic versions will automatically fill in duplicative areas on the forms and allow you to generate reports after entering the survey data. To simplify and streamline the data gathering process, we strongly encourage using the electronic submittal options.



Responsible Parties: The electronic version for *responsible parties* allows you to type your responses to FORMS 1, 2, 3, and 4 (if applicable). Following the entry of all required data, the information should be saved to a disc and mailed to the ARB, along with a completed hardcopy of FORM 1. If applicable, also include one hardcopy of the Confidential Information Form and the Voluntary Survey Evaluation. Note that while most information on FORM 1 can be entered electronically, an original signature is required (thus, a hardcopy must be printed and sent to the ARB).

Formulators: If you will be submitting ingredient information (FORM 4) on behalf of a *responsible party*, you have the option to use an electronic version of FORM 4 designed specifically for *formulators*. As with hardcopy submittal, you must first acquire the full product name and tracking # from the *responsible party*, which should be on the copy of the FORM 4 that is sent to you. Following the entry of all required data, the information should be saved to a disc and mailed to the ARB (see mailing addresses below). If applicable, send a hardcopy of the Confidential Information Form and the Voluntary Survey Evaluation with the disc. You may submit FORM 4(s) for multiple *responsible parties* on one disc.

Contact Jessica Dean via e-mail at **jdean@arb.ca.gov** to request either of the two electronic versions of the survey, which will be mailed to you on a compact disc (CD). In your email, make sure to specify whether you are requesting the *responsible party* version or the *formulator* version, by typing in the subject line either **"Responsible Party CD Request"** or **"Formulator CD Request"**. For all other questions regarding electronic submittal, contact the ARB staff (page III-11) or visit the survey website for more information: www.arb.ca.gov/consprod/regact/2003surv/2003surv.htm.

Submitting Product Labels

Responsible parties must submit one entire product *label* for each FORM 3 submitted (submit only one *label* for each product or *product group*). Make sure to include the entire *label* as defined:

> "Label" means any written, printed, or graphic matter affixed to, applied to, attached to, blown into, formed, molded into, embossed on, or appearing upon any consumer product or consumer product package, for the purposes of branding, identifying, or giving information with respect to the product or to the contents of the package.

Although electronic submittal of *labels* is preferred, you do have the option to submit your *label* via electronic file or hardcopy:

> Electronic labels: Submit clear, complete, and legible *labels* via PDF (Adobe Acrobat) image file, or other common file type, and name each file according to the Product Tracking # listed on all corresponding forms for that product. For example, when submitting the *label* for Product Tracking # "5," the acrobat file should be named: *product5.pdf.*
>
> Hardcopy labels: Send a clear, complete, and legible photocopy, or hard copy of a scanned image of the original *label*. Make sure to write the appropriate Product Tracking # on the *label*, according to the number listed on all corresponding forms for that product. Attach the *label* (or photocopy of the *label*) to the corresponding FORM 3 for the product or *product group*.

As noted at the bottom of FORM 3, the *responsible party* must check (✔) which option they will be using to submit the *label* for that product or *product group*. The options are:

- ❑ Label attached or submitted electronically, OR
- ❑ Label submitted in 2001 survey; 2001 Survey Product Tracking # _____.

Where a *label* is not submitted (because the *label* was already submitted as part of the 2001 survey), the following conditions must be met: 1) the product *label*, for sales year 2003, must be identical (same wording, claims, graphics, ingredients, size, and the like) to the *label* already submitted in the 2001 survey, **AND** 2) the product tracking number that was submitted for that *label* in the 2001 survey is listed at the bottom of FORM 3 (for purposes of tracking the previously submitted *label*).

If you have any questions about *label* submission, feel free to contact ARB staff (see page III-11).

Mailing

Refer to the "Checklist for Submitting the Survey" on the next page to ensure your survey packet is complete, and then return the completed survey (either the electronic or hardcopy option) to one of the addresses below.

Regular Mail:	**Overnight Mail:**
California Air Resources Board P.O. Box 2815 Sacramento, CA 95812 *Attn: SSD, Measures Development Section, 2003 Survey*	California EPA Headquarters Building Air Resources Board 1001 I Street (6th Floor) Sacramento, CA 95814 *Attn: SSD, Measures Development Section, 2003 Survey*

Checklist for Submitting the Survey

This checklist has been provided as a tool to help respondents ensure that each part of the survey has been completed before mailing. See "Mailing" section (previous page) for addresses. The table also summarizes "who" is responsible for "which" components of the survey, and lists the due dates for each survey component.

Required By:	Survey Component:	Due Date:
Everyone Who Receives the Survey Packet	✓ **Preliminary Form:** **Who Must Complete the 2003 Survey?** -upon receipt, immediately mail or fax to the ARB -submit one	November 24, 2004
Responsible Party	✓ **FORM 1 - Responsible Party Information** -submit one	March 15, 2005
	✓ **FORM 2 - Source of Ingredient Information** -submit one	
	✓ **FORM 3 - Product Information** -submit one per product or *product group* -attach one representative ***label*** to each FORM 3	
	✓ **Supplement to FORM 3 - Product Group Details** -submit one per *product group*	
Responsible Party and Formulator (*if applicable*)	✓ **FORM 4 - Ingredient Information** -submit one per product or *product group* -*responsible party* completes Section A (and B if applicable) -*responsible party* may need to forward FORM 4 to a *formulator* for completion of Section C	March 15, 2005
Responsible Parties for Aerosol Adhesives ONLY	✓ **FORMS AA-1, AA-2, and AA-3**	March 15, 2005
Optional For:	**Survey Component:**	**Due Date:**
Responsible Party and Formulator	✓ **Confidential Information Form** -submit one	March 15, 2005
	✓ **Voluntary Survey Evaluation** -submit one	

FOR MORE INFORMATION...

This section lists ways to obtain more information about this survey, *consumer products* and other air pollution regulations, and provides staff contacts.

Websites

The following sites are provided for more information, however, they are not required to complete this survey.

- **2003 Survey** – *www.arb.ca.gov/consprod/regact/2003surv/2003surv.htm* – Survey forms, related meetings and information, correspondence and other activities related to this survey are posted here. Survey Frequently Asked Questions (FAQ) will also be available here.
- **Consumer Products Program** – *www.arb.ca.gov/consprod/consprod.htm* – Provides information about the ARB consumer products program and allows you to sign up for a list-server, which will send you an e-mail notice when new information is posted to the consumer products website.
- **Consumer Products Regulations** – *www.arb.ca.gov/consprod/regs/regs.htm* – Provides links to the five existing consumer product regulations in California.
- **Reactivity** – *www.arb.ca.gov/research/reactivity/reactivity.htm* – Visit this site for background, current activities, and the latest information concerning reactivity.
- **ARB Homepage** – *www.arb.ca.gov* – ARB homepage with links to all programs, regulatory activities, and much more.
- **Air Quality-related Laws and Regulations** – *www.arb.ca.gov/html/lawsregs.htm* – This site provides links to federal, state, and district laws and regulations.
- **CAS Number Look-Up** –

  CambridgeSoft's ChemFinder:

  http://chemfinder.cambridgesoft.com

  National Library of Medicine Specialized Information Services' ChemIDPlus:
  http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

  National Institute of Standards and Technology's Chemistry Webbook:
  http://webbook.nist.gov/chemistry

  These sites provide search engines for chemical compounds, including CAS numbers. The sites may assist you with FORM 4 if your supplier is unable to supply CAS numbers for your ingredients.

ARB Staff Contacts

For general questions or other requests, please contact the following staff.

Name	Responsibility	Phone	Email
David Mallory	Manager	916-445-8316	dmallory@arb.ca.gov
Amy Livingston	Survey Lead	916-324-9551	alivings@arb.ca.gov
Tina Najjar	Electronic Submittals	916-323-6501	tnajjar@arb.ca.gov
Jessica Dean	Preliminary Forms and Requests for Electronic Versions of the Survey	916-322-2362	jdean@arb.ca.gov

PART IV:
Forms & Instructions

CONFIDENTIAL INFORMATION FORM

In accordance with title 17, California Code of Regulations (CCR), sections 91000-91022, 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; and (2) to the Federal Environmental Protection Agency (EPA), 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 (HSC, section 39660(e)).

Trade secrets, as defined in Government Code section 6254.7, are not public records and therefore will not be released to the public. However, the California Public Records Act states that air pollution emission data are always public records, even if the data comes within the definition of trade secrets. Even so, the information used to calculate air pollution emissions data is not "emissions data", and will not be released to the public if it is a trade secret.

Identifying Confidential Information

If any company believes that any of the information it may provide is a trade secret or otherwise exempt from disclosure under any other 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 the 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 the ARB determines, in accordance with the above referenced regulations, that the data do not qualify for a legal exemption from disclosure. The regulations establish substantial safeguards before any such disclosure.

To designate any information contained in your survey data as "confidential information", provide the data requested below and return this page with your completed survey forms.

1. In accordance with the provisions of title 17, California Code of Regulations, sections 91000-91022, and the California Public Records Act (Government Code sections 6250 seq.), (*enter company name*):_____ declares that only those portions specifically identified (by checking the upper left-hand corner confidentiality box on each form) and submitted in response to the California Air Resources Board's information request on the survey are confidential "trade secret" information, and requests that it be protected as such from public disclosure.

2. We have designated confidential information by page for each survey data form submitted by checking (✔) the upper left-hand corner confidentiality box.

   Name:_____ Signature:_____ Date:_____

3. In the case that there are inquiries pertaining to this confidential information, the ARB should contact the following person:

   Name: _____ Title: _____

   Phone: _____ Email: _____

   Company Address: _____

CALIFORNIA AIR RESOURCES BOARD *** 2003 CONSUMER & COMMERCIAL PRODUCTS SURVEY
STATIONARY SOURCE DIVISION, AIR QUALITY MEASURES BRANCH

Check (✔) if Confidential ☐

FORM 1 – Responsible Party Information

(Instructions for completing FORM 1: See back side)

1. Company Name: _____

Division Name(s): _____

Mailing Address: _____

City: _____ **State:** _____ **Zip:** _____

Webpage: _____

2. Parent Company Name (if applicable): _____

_____

Mailing Address: _____

City: _____ **State:** _____ **Zip:** _____

Webpage: _____

3. Contact Person: _____ **Phone:** _____ **Fax:** _____

Title: _____ **Email:** _____

4. NAICS Code(s): (see Attachment C for common codes) | | | | | |

5. Number of products: (enter total number of products and/or *product groups* submitted) |

6. Type of Business	**7. Gross Annual Receipts** *For Calendar Year 2003*	**8. Employees** *For Calendar Year 2003*		**9. Contract Employees** *For Calendar Year 2003*	
check (✔) all that apply	check (✔) one	Worldwide check (✔) one	California Only check (✔) one	Worldwide check (✔) one	California Only check (✔) one
☐ Manufacturer/ Marketer	☐ Less than $250,000	☐ None	☐ None	☐ None	☐ None
☐ Distributor	☐ Between $250,000 and $1 million	☐ 1 to 10	☐ 1 to 10	☐ 1 to 10	☐ 1 to 10
☐ Retailer	☐ Between $1 million and $10 million	☐ 11 to 100	☐ 11 to 100	☐ 11 to 100	☐ 11 to 100
☐ Contract Packager	☐ Between $10 million and $50 million	☐ 101 to 250	☐ 101 to 250	☐ 101 to 250	☐ 101 to 250
☐ Other (specify):	☐ Between $50 million and $100 million	☐ 251 to 500	☐ 251 to 500	☐ 251 to 500	☐ 251 to 500
_____	☐ Between $100 million and $1 billion	☐ 501 to 750	☐ 501 to 750	☐ 501 to 750	☐ 501 to 750
	☐ More than $1 billion	☐ More than 750	☐ More than 750	☐ More than 750	☐ More than 750

10. Comments: _____

_____

11. Certification: I am an authorized representative (management level) of the *responsible party* listed above and certify that all information submitted in this survey is complete, true, and correct.

Name: _____ **Title:** _____

Signature: _____ **Date:** _____

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Instructions: FORM 1 – Responsible Party Information

The information requested on FORM 1 will assist the California Air Resources Board in characterizing the types of businesses that are included in the survey as required by California State Law. A single FORM 1 must be completed and submitted for each *responsible party*. Do not submit a separate FORM 1 for each product being submitted. NOTE: Throughout the survey, when the term "company" is used, "company, firm, or establishment" is implied.

Confidential Information *(in the upper left corner of all forms):*

The *responsible party* should check the box if information on this form is confidential. This information will be handled as described on page IV-2.

Check (✔) if Confidential ❑

1. **Company Name:** Enter the name of the company that is the *responsible party* for the product(s) being submitted with this FORM 1.

   responsible party means the company, firm, or establishment listed on the label of a consumer or commercial product reportable under this survey (see survey categories, Attachment A) that was sold with intention for use in California during Calendar Year 2003. If the *label* lists two companies, firms, or establishments, the responsible party is the party that the product was "manufactured for" or "distributed by," as noted on the *label.*

   Division Name(s): If the respondent to the survey is representing a division of the company, please enter the name of the division.
   Mailing Address: Enter the complete mailing address for the company listed above.
   Webpage: Enter the URL (web address) for the company listed above.

2. **Parent Company Name:** If the company is not *independently owned*, enter the name of the *parent company*.
   Mailing Address: Enter the complete mailing address for the *parent company* listed above.
   Webpage: Enter the URL (web address) for the *parent company* listed above.

3. **Contact Person:** Enter the name, title, telephone number, fax number, and email address for the person to be contacted by ARB staff if clarifications are needed for the survey information submitted.

4. **NAICS Code(s) (North American Industry Classification System):** Enter the 2002 NAICS code(s) that apply to the *responsible party* for the products covered by this survey. Attachment C provides a list of common 2002 NAICS codes related to consumer and commercial products. For a complete list of NAICS codes and more information about NAICS codes, visit: *http://www.census.gov/epcd/www/naics.html*

Continued, next column...

5. **Number of products:** Count and enter the total number of products and/or *product groups* that your company is submitting for this survey. The Product Tracking # boxes, like the one shown here and those located in the upper right corner of FORMS 3, 4 and the Supplement to FORM 3, are used to track the number of products or *product groups* you have, and are also used to associate related forms. Because Product Tracking numbers are entered sequentially, as described on page III-5, the final number should indicate the total number of products submitted.

   Product Tracking #: _____

6. **Type of Business:** Check (✔) each box that describes the type of business conducted by the *responsible party*. See Related Definitions in Part VII, for business type definitions.

7. **Gross Annual Receipts:** Check (✔) the box that identifies the gross annual receipts generated by the *responsible party* worldwide for Calendar Year 2003. This means the total income of the company before expenses are deducted.

8. **Employees:** Check (✔) the box that indicates the total number of employees (including part-time and temporary staff, not including *contract employees* listed in question 9) for the *responsible party* "Worldwide" (including California), and also for "California Only."

9. **Contract Employees:** Check (✔) the box that indicates the total number of *contract employees* for the *responsible party* "Worldwide" (including California), and also for "California Only."

10. **Comments:** As needed, provide comments to clarify any piece of information you have listed on this form.

11. **Certification:** Provide the name, title, signature, and date of signature of an authorized representative (management level) for the *responsible party* listed in item 1, certifying that all information submitted in this survey is complete, true, and correct.

Check (✔) if Confidential ❑

FORM 2 – Source of Ingredient Information

(Instructions for completing FORM 2: See back side)

Will your company be using a *formulator*? Check (✔) "no" or "yes" and complete the blanks as indicated.

❑ **No, my company, _____, the *responsible party*, will not be using a *formulator* to complete ingredient information for any product or *product group* submitted for this survey.**

– OR –

❑ **Yes, my company, _____, the *responsible party*, will be using a *formulator* to complete ingredient information for one or more products submitted for this survey.** *List formulator contact information below; photocopy sheet as needed.*

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____ **Formulator Contact Name:** _____

_____ **Title:** _____

Address: _____ **Phone:** _____ **Fax:** _____

City: _____ **State:** _____ **Zip:** _____ **Email:** _____

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____ **Formulator Contact Name:** _____

_____ **Title:** _____

Address: _____ **Phone:** _____ **Fax:** _____

City: _____ **State:** _____ **Zip:** _____ **Email:** _____

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____ **Formulator Contact Name:** _____

_____ **Title:** _____

Address: _____ **Phone:** _____ **Fax:** _____

City: _____ **State:** _____ **Zip:** _____ **Email:** _____

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Instructions: FORM 2 – Source of Ingredient Information

Will your company be using a *formulator*?

No.

Check (✔) this box if...
your company, the *responsible party*, will not be using a *formulator* to submit ingredient information on behalf of your company for any product submitted for this survey.

Then:

- Submit this form to ARB with the other survey forms (you do not need to complete the lower portion of FORM 2).

OR

Yes.

Check (✔) this box if...
for one or more products, your company, the *responsible party*, will be using a *formulator* to submit ingredient information on behalf of your company.

Then:

- Complete one contact information box on the bottom portion of this form for each *formulator* that will submit ingredient information on behalf of your company.

  Notes:

  - You only need to list a *formulator* once; if a *formulator* will send ingredient information for multiple products or *product groups*, list all the product tracking numbers for those products at the top of the corresponding *formulator* contact information box. See page III-5 for more information about product tracking numbers.
  - If you will be using more than three *formulators*, photocopy this form as necessary.
  - If multiple *formulators* were used for a product or *product group* during Calendar Year 2003, choose a representative *formulator* to complete ingredient information, and list that *formulator* on this form.

- Make sure you have entered the product tracking number on each FORM 4 *and* completes Sections A and B before forwarding FORM 4 to the *formulator*.
- As soon as possible, forward each FORM 4 to the *formulator* who will be completing Section C, the ingredient information. The *formulator* should mail the FORM 4(s) directly to the ARB.
- Submit this FORM 2 to the ARB with the other survey forms.

Check (✔) if Confidential ❑

FORM 3 – Product Information

(Instructions for completing FORM 3: See back side)

Product Tracking #: _____

1. Full Product Name: _____ **2. Company Name:** _____

3. ARB Category Code(s)
Primary Category Code: [ ] *If applicable*, Additional Category Code(s): [ ] [ ] [ ] [ ]

4. Product Groups
Does this product represent a *product group*?
❑ yes ❑ no
If yes, list individual products on "Supplement to FORM 3".
Also specify which attribute(s) were used to group the products: ❑ Color ❑ Fragrance ❑ Size ❑ Botanical/herbal extract

5. Delivery/ Packaging System
check (✔) one
- ❑ wipes/towels/cloths/sheets/pads
- ❑ pressurized aerosol container
- ❑ non-pressurized pump system (i.e. spray, foam, liquid)
- ❑ barrier pack or compartmentalized dispenser
- ❑ jar/can/tub/pourable bottle
- ❑ squeeze tube or squeeze bottle
- ❑ other (specify): _____

6. Dispensed Form
check (✔) one
- ❑ post-foaming gel
- ❑ foam/mousse
- ❑ liquid
- ❑ semisolid
- ❑ solid
- ❑ mist/dispersed spray
- ❑ other (specify): _____

7. Relation to Product
check (✔) all that apply
- ❑ Manufacturer/ Marketer
- ❑ Distributor
- ❑ Retailer
- ❑ Contract Packager
- ❑ Other (specify): _____

8. Customer Type
check (✔) all that apply
- ❑ Household _____%
- ❑ Commercial/ Institutional _____%
- ❑ Industrial _____%

total must = 100%

9. Dilution Ratios
Is this product sold as a *concentrate*? ❑ yes ❑ no
If yes, complete the dilution ratio table below.
Also specify the *diluent*: _____

	Product		Diluent	
Dilution:	*amount*	*units*	*amount*	*units*
least dilute				
most dilute				

10. Sales Data Collection Method
check (✔) one
- ❑ Used CA-specific sales data
- ❑ Estimated by prorating data
  Specify "national", "regional", "distribution centers" or other: _____
- ❑ Other collection method used (specify): _____

11. General Information
- Is this a *pet care product*? ❑ yes ❑ no
- Is this a FIFRA registered product? ❑ yes ❑ no
- Is this product regulated by the FDA as an OTC drug? ❑ yes ❑ no
- Does this product contain a resin, polymer, or other film-forming compound? ❑ yes ❑ no

12. 2003 California Sales Data: complete for each size sold *(for wipes/towels and barrier packs see instructions)*

	Product Size (from label)	Volume/Mass filled (include *overfill* of 2% or more)	Units (wt oz or fl oz)	Qty Sold	Liquids (fl oz) only: *Density (units)*	*-OR- Specific Gravity*
#1						
#2						
#3						
#4						
#5						
#6						

13. Comments: _____

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LABELS: Submit one entire representative *label* for this product or *product group*.
Check (✔) one: ❑ Label attached or submitted electronically, **OR** ❑ Label submitted in 2001 Survey; 2001 Survey Product Tracking #: _____ *(required for this response)*

Instructions: FORM 3 – Product Information

This form requests general product information, sales data, and *labels* for the products being reported. Complete and submit one FORM 3 for each product or *product group*.

Confidential Information ***(in the upper left corner of all forms):*** The *responsible party* should check the box if the information on this form is confidential. This information will be handled as described on page IV-2.

Check (✓) if Confidential ☐

Product Tracking # ***(in the upper right corner of Forms 3 and 4):*** Assign a single product tracking number for each product or *product group*. Enter this number into the box. For each product or *product group* submitted, this number should be the same on *both* FORM 3 and FORM 4, and also associated with the corresponding *label*. See page III-5 for more information on assigning product tracking numbers.

Product Tracking #: _____

1. **Full Product Name:** Enter the full product name as shown on the *principal display panel.*

   Notes: **Product Groups** – If this is a *product group*, name the most representative product for the group. See page III-5 for *product group* criteria.

   Kits – When multiple products are sold together in one kit or package, individual components must be reported separately, according to survey categories. Include the component name in the product name.

   For example: "ACME French Manicure Kit" includes "Base/Top Coat", "White Tips Polish", and "Natural Polish". Each of these three components must be reported since they fit a separate category in this survey. The full product name for the natural polish would be "ACME French Manicure Kit; Natural Polish".

2. **Company Name:** Enter the name of the company that is the *responsible party* for the product listed on this form.

3. **ARB Category Code(s):** Enter the appropriate category code from Attachment A. Choose the primary category code that best describes your product according to the product's *principal display panel*. Only list additional category codes for products that fit more than one survey category, according to their *principal display panel*; do not list category codes for uses not displayed on this panel. See "Reporting Products" on page III-4 for more details .

4. **Product Groups:** Indicate by checking "yes" or "no" if this product represents a *product group*. See page III-5 for *product group* criteria. **If "yes,"** specify which attribute(s) were used to group the products. Additionally, for the *product group*, list the name, size, color differences, and/or *fragrance* differences of each product that comprises the group as indicated on the "Supplement to FORM 3." Photocopy this form as needed.

Continued, next column...

5. **Delivery/Packaging System:** Check the box that best describes the delivery or packaging system used for this product. If the provided options don't describe your product, indicate "other" and specify the delivery or packaging method employed.

6. **Dispensed Form:** Check the box that best describes the form of this product as it is dispensed, or as it leaves the delivery or packaging system. If the product is also sold in another form, it is considered a separate product and must be reported separately. If the provided options (see definitions below) don't describe your product, indicate "other" and specify the dispensed form.

   post-foaming gel means a semisolid that, upon being dispensed from its container, or upon contact with a surface, or as a result of exposure to body heat or the atmosphere, changes from a semisolid state to a foaming state. "Post-foaming gel" does not include substances that become foam solely from shearing action after being dispensed, such as rubbing the product on the skin or other agitation.

   Note: Report non-foaming gels under the "semisolid" option.

   foam/mousse means a substance that is comprised of two phases: a dispersed gas or vapor phase, and a continuous liquid phase, therein creating a mass of gaseous cells that is separated by thin films of liquid and formed by the juxtaposition of bubbles.

   liquid means a substance or mixture of substances which is capable of a visually detectable flow as determined under ASTM D-4359-90. "Liquid" does not include powders or other materials that are composed entirely of solid particles.

   Note: Most wipes/towels/cloths/sheets/pads should be reported as "liquid" here. Report mist or dispersed sprays under the "mist/dispersed spray" option.

   semisolid means a product that, at room temperature, will not pour, but will spread or deform easily, including but not limited to gels, pastes, and greases.

   Note: Report post-foaming gels under "post-foaming gel" option.

   solid means a substance or mixture of substances which, either whole or subdivided (such as the particles comprising a powder), is not capable of visually detectable flow as determined under ASTM D-4359-90.

   mist/dispersed spray means a substance that, upon being dispensed, generally yields a uniform application of discrete particles or droplets.

7. **Relation to Product:** Indicate whether you are the *manufacturer/marketer*, *distributor*, *retailer*, and/or *contract packager* of this product. If these descriptions do not fit your relationship(s) to the product, check the "other" box and specify the relationship. Check all boxes that apply.

Continued, next page.

(*Continued*) Instructions: FORM 3 – Product Information.

8. **Customer Type:** Check all boxes that indicate the customer type for which this product is intended. Also, indicate the percentage of each customer type in the blanks provided. The percentages must total 100%.

9. **Dilution Ratios:** Indicate by checking "yes" or "no" if this product is sold as a *concentrate* that requires dilution according to the product *label*. **If "yes,"** list the amounts of the product and *diluent*, and the type of *diluent*, in the spaces provided. The "least dilute" will be the highest amount of product to *diluent* (i.e., most concentrated), as specified on the product's *label*. "Most dilute" will be the smallest amount of product to *diluent* as specified on the product's *label* (i.e., least concentrated). If a product can be used "straight" or non-diluted as well as diluted, the "least dilute" value will be 1 part product to 0 parts diluent. *Do not* use arbitrary terms such as "scoop"; specify appropriate units of measure, such as 0.25 cups. However, ratios are acceptable.

   For example: on the *label*, a concentrated hair care product recommends diluting 1 part product to 1 part water for "extra" hold and 1 part product to 4 parts water for "light" hold. So, the *diluent* is water and the table would read as shown.

	Product		Diluent	
Dilution:	*amount*	*units*	*amount*	*units*
least dilute	1	part	1	part
most dilute	1	part	4	part

10. **Sales Data Collection Method:** To specify how the quantity of units sold ("Qty Sold") in item 12 was determined, indicate which sales data was used: California-specific sales, or prorated sales data by population (see population estimates provided in Attachment D). If prorating was used, specify whether national, regional, or distribution sales data was prorated, or whether a different prorating method was used. If sales data was collected in a way other than California-specific or by prorating, check "Other Collection Method Used" and describe how sales data was collected. Use the "Comments" section, item 13, if more space is needed.

11. **General Information:** Indicate by checking "yes" or "no" if this product 1) is a *pet care product*, 2) is a FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) registered product, 3) is regulated by the Food & Drug Administration (FDA) as an Over-the-Counter (OTC) drug (*Note: Prescription-only drugs are not covered by this survey and do not need to be reported*), and 4) contains a resin, polymer, or other film-forming compound.

Continued, next column...

12. **2003 California Sales Data:** Provide the sales information for this product (or combined sales for this *product group*) for Calendar Year 2003. **Please note that internet sales must be included.** Use the comment field (item 13) to report additional sizes, if there are more than six.

    Product Size: List each size that this product or *product group* is sold in. Record the size(s) directly from the product *label(s).*

    Volume/Mass filled: For each size listed, indicate the average total volume (in fl oz) or average total mass (in wt oz) of product actually filled into the container, including *overfill* amounts of 2% or greater. If the product is not overfilled by 2% or greater, simply re-enter the value from the previous column. Refer to sample product #1, found on page VI-2, for an example of how to fill out the *overfill* question.

    "Overfill" means the amount of product in a container that exceeds the mass or volume stated on the product label.

    Barrier packs and compartmentalized containers: report the mass or volume of product and *propellant*, including overfill, both **inside** and **outside** the bag or **above** and **below** the piston, even if this amount does not match the product size on the *label*.

    Wipes/towels/cloths/sheets/pads: report only the mass or volume of liquid (or other substance) in the impregnated substrate.

    Units: Indicate whether this product is sold in weight ounces (wt oz) or fluid ounces (fl oz). This unit should apply to both numbers listed in the previous two columns, "Product Size" and "Volume/Mass filled".

    Qty Sold: List, for each size, the total number of units sold in California during 2003. **Please note that internet sales must be included.** If this is a *product group*, combine the sales of the individual products within each size.

    Liquids (fl oz) only: For liquids reported in fluid ounces, provide either the density, indicating the units (pounds/gal or grams/milliliter), or the specific gravity. *For density, use the abbreviations #/gal or g/ml.* It may be necessary to contact your formulating company to acquire this information.

13. **Comments:** Provide any comments that will help us understand your product or how you have filled out the survey for this product.

LABELS: **See "Submitting Product Labels" on page III-9.** Submit one entire representative product *label* for each FORM 3 (only one for each product or *product group*). See the checkboxes on the form and page III-9 for further instructions on *label* submittal.

Supplement to FORM 3 – Product Group Details

Product Tracking #: _____

The table below has been provided *only* for those companies that have grouped products together for the purposes of this survey (see FORM 3, Item 4).

1. Copy the following from FORM 3:

- Company Name:_____
- Full product name representing this *product group*:_____
- Product Tracking #: *place in box, upper right corner of this page.*

2. Complete the following columns according to the method used to group the products (by color, *fragrance*, botanical/herbal extract, and/or size), which is also indicated by checking the attribute box(es) on FORM 3. Submit one completed copy of this page for each FORM 3 that represents a *product group.*

Individual Product Name	**Color** (if applicable)	**Fragrance/ Botanical or herbal extract** (if applicable)	**Size and units** (if applicable)
More products to list? Photocopy this page as needed.			

Check (✔) if Confidential ❑

FORM 4 – Ingredient Information

(Instructions for completing FORM 4: See back side)

Product Tracking #: _____

A. PRODUCT NAME & RESPONSIBLE PARTY COMPANY NAME – ***To be completed by the responsible party; copy from corresponding FORM 3.***

Full Product Name: _____ **Company Name:** _____

B. RESPONSIBLE PARTY CONTACT INFORMATION – ***Only needed when responsible party is sending this form to a formulator for completion of Part C.***

Contact Person: _____ **Phone:** _____ **Fax:** _____

Title: _____ **Email:** _____

C. INGREDIENTS – ***To be completed by the company that holds the ingredient information (either the responsible party or formulator).***

1. Specific Ingredient Table: Indicate the weight percent (Wt. %) of the following compounds that are contained in the product.

HFC-134a	1,1,1-Trichloroethane	Parachlorobenzotrifluoride	AMP	Perchloroethylene	Paradichlorobenzene	Naphthalene	Nitrogen	Menthol

HCFC-141b	Methylene Chloride	Volatile Methyl Siloxanes	HFC-152a	Acetone	Methyl Acetate	Carbon Dioxide	Water	C1 % Subtotal
								= C1

2. Speciation Table: List all *VOCs*, *partial LVP-VOCs*, and *LVP-VOCs* (see Attachment E for "LVP-VOCs to be Individually Reported") that comprise at least 0.1 Wt. %. Group other *LVP-VOCs* (those not reported individually), other exempts (those not listed above), other inorganics (those not listed above), all fragrance, and all *VOCs* that *individually* comprise less than 0.1 Wt. %, as indicated in each line-item entry below.

	Chemical Name	CAS Number	Trade Name & Manufacturer*	Bin #*	Weight %
1					
2					
3					
4					
5					
6					
7					
8					

If more lines are needed, list additional ingredients on a separate page; enter the weight percent subtotal from that page on this line: =

Group other *LVP-VOCs* (those not listed individually above): **Group Total** =

Group other exempts (those not listed in item C1): **Group Total** =

Group other inorganics (those not listed in item C1): **Group Total** =

Group all Fragrance: **Group Total** =

Group *VOCs* that are *each* less than 0.1 Wt. %: **Group Total** =

Section C2 % Subtotal = C2

Grand Total ***(Sections C1 + C2 must = 100%)*** = Total

3. ***Ingredient Contact Information***

Completed By: _____

Title: _____ **Phone:** _____ **Email:** _____

Formulating Company: _____ **Date:** _____

Questions? Visit www.arb.ca.gov/consprod/regact/2003surv/2003surv.htm

*Completion of these columns is required only if the ingredient is a *hydrocarbon solvent*, such as mineral spirits; otherwise these columns are optional. See instructions for details and Attachment F for a list of trade names and bin numbers.

Instructions: FORM 4 – Ingredient Information

This form requests ingredient information for the products being reported. If the *responsible party* holds all ingredient information, then that company will complete both Sections A and C of this form (Section B is optional). If the *responsible party* does not hold the ingredient information, this form will be completed by two companies: the *responsible party* (Sections A and B), and the *formulator* (Section C). One completed FORM 4 must be submitted to ARB for each product or *product group*.

Confidential Information *(in the upper left corner of All Forms):*
The *responsible party* should check the box if the information on this form is confidential. This information will be handled as described on page IV-2.

Check (✔) if Confidential ❑

Product Tracking # *(in the upper right corner of Forms 3 and 4):* For a product or *product group*, this number is identical to that assigned on FORM 3. See page III-5 for more information on assigning product tracking numbers.

Product Tracking #: _____

A. PRODUCT NAME & RESPONSIBLE PARTY COMPANY NAME
List the full product or *product group* name, as it appears on FORM 3. List the *responsible party's* company name, which was also listed in the first section of FORM 1.

B. RESPONSIBLE PARTY CONTACT INFORMATION
This section is only needed if the *responsible party* is sending this form to a *formulator* for completion of ingredient information in Section C. The contact information is provided here for cases where a *formulator* may need to contact the *responsible party.*

C. INGREDIENTS: ROUND TO THE NEAREST 0.1 WEIGHT PERCENT.
This section, which gathers ingredient information about this product, is to be completed by the holder of the ingredient information, whether it is the *responsible party* or a *formulator.*

If multiple formulas were used for this product during Calendar Year 2003, the most recent formula should be reported. If the ingredients varied because they were supplied by different vendors, report the ingredients from the most representative vendor.

1. **Specific Ingredient Table:** If the product contains any of the compounds listed, enter the weight percent to the nearest 0.1% for each compound (HFC-134a, 1,1,1-Trichloroethane, Parachlorobenzotrifluoride, Perchloroethylene, Aminomethylpropanol (AMP), Paradichlorobenzene, Naphthalene, Nitrogen (N_2), Menthol, HCFC-141b, Methylene Chloride, Volatile Methyl Siloxanes, HFC-152a, Acetone, Methyl Acetate, Carbon Dioxide, and Water).

   Subtotal: Solely to make the Grand Total easier to calculate, subtotal the weight percent (Wt. %) of both lines as indicated at the right (C1 % Subtotal).

2. **Speciation Table:** In the table, list all *Volatile Organic Compounds* (*VOCs*), *partial LVP-VOCs*, and all *Low Vapor Pressure Volatile Organic Compounds* (*LVP-VOCs*) (see Attachment E, "LVP-VOCs to be Individually Reported") that comprise at least 0.1 weight percent (Wt. %) of the product. See the Related Definitions section in Part VII, for definitions of *VOC*, *partial LVP-VOC*, *LVP-VOC*, and *Hydrocarbon Solvent.*

   Required for each ingredient listed:

   Chemical Name: Enter the generic or chemical name for the compound.

   CAS Number: Enter the Chemical Abstract Service (CAS) number for the compound or mixture obtained from your supplier.

   Weight Percent: Enter the weight percent of the ingredient, to the nearest 0.1%. If the ingredient is a mixture of known components, list the weight percentages of the individual components.

   Note: If the product is sold as a concentrate, list the Wt. % as sold (undiluted).

   Trade Name Manufacturer, and Bin #: These columns are required only for *hydrocarbon solvents*. A list of *hydrocarbon solvents,* bin numbers and other information has been provided in Attachment F and Attachment G.

   Trade Name: Manufacturer's proprietary name for the compound or mixture.

   Manufacturer Name: Enter the name of the manufacturer for the compound or mixture.

   Bin #: List the bin number for the compound or mixture. Please contact your manufacturer if you do not know the bin number.

Continued, next column...

Continued, next page...

(Continued) Instructions: FORM 4 – Ingredient Information

More Lines needed? If there are **more than eight** speciated ingredients for this product, photocopy this table and continue to specify the compounds as shown. Attach the photocopy to this FORM 4 and enter a weight percent (Wt. %) subtotal from that page in the space indicated, just above the "grouped" items.

Grouped Totals (line-item entries in bottom right portion of FORM 4) Enter the aggregated weight percent, as indicated, of those ingredients not listed on the "Specific Ingredient Table" or the "Speciation Table" in this section:

Group other LVP-VOCs: Aggregate any remaining *LVP-VOCs*, (those that individually comprise less than 0.1 Wt. % or any not included in the speciation table above).

Group other exempts: Aggregate other ARB-exempt ingredients (those not already listed in Section C1). See the definition of *VOC* in the Related Definition section of Part VII for the list of ARB exempt compounds.

Group other inorganics: Aggregate other inorganics (all those except nitrogen and water, which were included in Section C1 "Specific Ingredient Table" above).

For example, these compounds may include, but are not limited to, ammonia, clay, hydrogen peroxide, and metallic salts.

Continued, next column...

Group all fragrance: Aggregate all *fragrance* and enter the total in the space indicated. See the definition of "fragrance" in the Related Definition section of Part VII.

Note: d-limonene, l-limonene, and pine oils must be speciated in the *VOC* speciation table above.

***Group VOCs* that are each less than 0.1 Wt.%:** Aggregate all *VOC* compounds for which *each* individual compound comprises less than 0.1 weight percent of the product. Enter total in the space indicated.

Section C2 Subtotal: Sum the weight percentages for all ingredients listed in this table (including the line-items entries).

Grand Total: Sum Subtotals C1 and C2, and enter the value in the Grand Total box. **The Grand Total *must* equal 100 percent.** If this value does not sum to 100, check the component percentages for errors.

3. **Contact Information:** This information references the party that completed this section (Section C, the ingredients section). Enter the name, title, telephone number, and email address and company of the person ARB should contact for clarification about ingredient information submitted. Enter the date this form was completed.

For questions about filling out this or other forms, please contact ARB staff, see page III-11.

PART V:
Attachments for Reference

ATTACHMENT A: LIST OF SURVEY CATEGORIES AND CODES

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
10000 ADHESIVES, SEALANTS, AND RELATED PRODUCTS *		
**see notes on page III-3, for size reporting exclusions (under "Types of Products to Report...and Not to Report")*		
10100 Adhesives		
	10101	Arts and crafts adhesive
	10102	**Automobile headliner adhesive**
	10103	**Automotive engine compartment adhesive**
	10104	Carpet and tile adhesive
	10105	**Construction, panel, and floor covering adhesive**
	***	**Contact adhesive-general purpose**
	***	**Contact adhesive-special purpose**
	10108	Fabric/textiles adhesive
	10109	**Flexible vinyl adhesive**
	10110	**General purpose adhesive**
	10111	Household glues and paste
	10112	**Laminate repair/edgebanding adhesive**
	10113	**Mist spray adhesive**
	10114	**Mounting adhesive**
	10115	Plastic pipe cement and primer
	10116	**Polyolefin adhesive**
	10117	**Polystyrene foam adhesive**
	10118	Rubber cement
	10119	Specialty automotive adhesive
	10120	Tackifying agent (semi-permanent)
	10121	Temporary/removable adhesive
	10122	Thread locking compound
	10123	Wallpaper adhesive
	10124	**Web spray adhesive**
	10125	Woodworking glue
	10199	Other adhesives
10200 Sealants and Caulks		
	10201	Caulking compound
	10202	Cold process roof cement (aerosol only)
	10203	Driveway patching compound
	10204	**Floor seam sealer**
	10205	Insulating and sealing foam
	10206	Painter's putty
	10207	Pipe thread sealant
	10208	Plumber's putty
	10209	**Sealant and caulking compound**
	10210	Spackling compound
	10211	Tile and grout sealer
	10212	Window glazing compound
	10213	Wood filler
	10299	Other sealants and caulks

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
20000 HOUSEHOLD AND INSTITUTIONAL PRODUCTS		
20100 Air Fresheners		
	***	**Air freshener, double phase aerosol**
	20102	**Air freshener, liquid or pump spray**
	20103	**Air freshener, single phase aerosol**
	20104	**Air freshener, solid or semisolid**
	20105	Aromatherapy product
	20106	**Dual purpose air freshener/disinfectant (aerosol)**
	***	Incense product
	20108	Liquid candle, aromatherapy, and potpourri oil
	20109	Odor remover/eliminator
	20110	Plug-ins
	20111	Potpourri air freshener
	***	Scented candles
	20113	Scented oil
	20199	Other air fresheners
20200 Arts and Crafts Supplies		
	***	Artist solvent and thinner
	***	Ceramic finishing product
	***	Specialty cleaning product
	***	Other arts and crafts supplies; see also 10000 Adhesives, Sealants, and Related Products
20300 Cleaners and Degreasers		**20300 Cleaners and Degreasers con't next page...**
	20301	**Bathroom and tile cleaner**
	20302	Bug and tar remover (non-automotive)
	20303	Cooktop cleaner
	20304	**Disinfectant**
	20305	**Dusting aid**
	20306	Garbage disposal cleaner
	20307	**General purpose cleaner**
	20308	**General purpose degreaser**
	20309	**Glass cleaner (aerosol)**
	***	**Glass cleaner (non-aerosol)**
	20311	Grout cleaner
	20312	Gum or candle wax remover
	20313	Hard surface rust stain remover
	***	Jewelry cleaner, polish, and soap
	***	**Metal polish/cleanser**
	20316	Mildew remover
	20317	Multi-purpose remover
	20318	**Oven cleaner**
	20319	Plastic cleaner
	20320	Sanitizer (includes air sanitizer)
	***	Septic tank cleaner
	***	Soap impregnated scouring pad
	***	**Toilet/urinal care product**

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
	***	**Wood cleaner**
	20399	Other cleaners and degreasers; see also 60000, Solvent and Thinning-related Products
20400 Dishwashing Products		
	***	Dish detergent/soap (manual)
	***	Dish detergent/soap (machine)
	***	Dishwasher sanitizer
	***	Film and spot remover
	***	Grill cleaner
	***	Pretreatment/presoak
	***	Rinse aid
	***	Other dishwashing products
20500 Fabric, Carpet, and Upholstery Care Products (Non-Laundry Products)		
	***	**Anti-static product**
	20502	**Carpet and upholstery cleaner**
	***	Carpet deodorizer and freshener
	20504	Fabric and carpet dye
	20505	**Fabric protectant**
	20506	**Waterproofer**
	***	**Fabric refresher**
	20508	**Spot remover**
	20509	Waste and urine deodorizer
	20510	Water repellant
	20599	Other fabric, carpet, and upholstery care products
20600 Food-Related Sprays and Aerosol Products		
	20601	**Aerosol cooking spray**
	***	Aerosol cheese topping
	***	Aerosol dessert topping
	***	Non-aerosol cooking spray
	***	Vegetable wash spray
	***	Other food-related sprays and aerosol products
20700 Fuels and Lighter Materials		
	20701	**Charcoal lighter material**
	20702	Fire log and related products
	20703	Lighter fluid (non-charcoal)
	20704	Portable cooking/heater/stove fuel
	20705	Self-starting briquet
	20706	Wick lamp fuel, scented and nonscented
	20707	Wood fire starter
	20799	Other fuels and lighter materials

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
20800 Garden and Lawn Care Products		
	***	Anti-desiccant/anti-transpirant products
	***	Blossom set products
	***	Foliar sprays without pesticide claims
	***	Leaf shine products
	***	Pesticide adjuvants
	***	Plant growth regulators
	***	Pruning/grafting sealers or paints
	***	Soil Penetrants
	***	Other garden and lawn care products
20900 Laundry Products		
	20901	Bluing agent
	20902	Detergent booster
	***	Detergent
	20904	Dryer sheets
	20905	Fabric softener
	20906	Fabric wash
	20907	In-dryer fabric care
	20908	**Laundry prewash**
	20909	**Laundry starch product**
	20910	Presoak
	20911	**Spot remover**
	***	Soap
	20913	Sizing and fabric finish
	***	Washing soda
	20915	Water softener and conditioner
	20916	Whitener/brightener
	20917	Wrinkle releasing spray/reducer/remover
	20999	Other laundry products
21000 Miscellaneous Household Products		
	***	Drain opener
	21002	Driveway cleaner
	21003	Household mold and mildew retardant
	21004	**Multi-purpose dry lubricant**
	21005	**Multi-purpose lubricant**
	21006	**Penetrant**
	21007	Plant leaf cleaner and wax
	***	**Rubber and vinyl protectant (aerosol)**
	21009	**Rubber and vinyl protectant (non-aerosol)**
	***	**Silicone-based multi-purpose lubricant**
	21011	Stone maintenance product (includes counter and floor products)
	21012	Other lubricants and penetrants
	21099	Other miscellaneous household products

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
21100 Office Supply Products		
	***	Chalkboard or whiteboard cleaner
	***	Correction fluid
	***	Dry erase markers
	***	Highlighters
	***	Inks, toners, ribbons, and cartridges for office equipment
	***	Permanent markers
	***	Wet erase markers
	***	Other office supply products
21200 Pool/Spa/Whirlpool/Jacuzzi/Pond Products		
	***	Algae control
	***	Balancer
	***	Clarifier
	***	Cleaner
	***	Fragrance
	***	pH balancer
	***	Pool/spa/whirlpool/jacuzzi/pond disinfectant
	***	Sanitizer
	***	Shock treatment
	***	Stain remover
	***	Water balancer
	***	Other pool/spa/whirlpool/jacuzzi maintenance products
21300 Shoe and Leather Care Products		
	***	**Footware or leather care product**
	***	Leather preservative treatments (including waterproofers)
	***	Other shoe and leather care products
21400 Waxes and Polishes		
	21401	**Floor polish or wax (for flexible flooring material)**
	21402	**Floor polish or wax (for nonresilient flooring)**
	21403	**Floor polish or wax (for wood floors)**
	21404	**Floor wax stripper**
	***	**Furniture maintenance product (aerosol)**
	21406	**Furniture maintenance product (non-aerosol)**
	21407	**Spray buff product**
	21499	Other household waxes and polishes
30000 PERSONAL CARE PRODUCTS		
30100 Antiperspirants and Deodorants		
	30101	**Antiperspirant**
	30102	**Deodorant**
	30103	Foot deodorant
	30104	Feminine hygiene deodorant
	30199	Other antiperspirant and deodorant products

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
30200 Body, Hand, and Face Cleaners		
	30201	Anti-microbial dry hand wash
	30202	**Anti-microbial hand or body cleaner or soap**
	30203	Aromatherapy bath or shower product
	30204	**Astringent and toner (Medicated**; FDA regulated)
	30205	**Astringent and toner** (Non-FDA regulated)
	***	Bath oils/beads/capsules
	30207	Body wash/mousse/gel/soap/foam/scrub
	30208	Body wipes/towelettes
	30209	Chemical peels
	30210	Exfoliant/peel/polish
	30211	Eye makeup remover
	30212	Face wipes/towelettes
	***	**Facial cleaner and soap**
	***	Facial masque/mask
	30215	**General use hand or body cleaner or soap**
	30216	Hand wipes/towelettes
	***	**Heavy-duty hand cleaner or soap**
	30218	Other face soaps/cleaners/scrubs
	30299	Other hand cleaners, sanitizers, and soaps
30300 Eyeglass and Contact Lens Care Products		
	***	Contact lens cleaners
	***	Eyeglass cleaners
	***	Other eyeglass and contact lens care products
30400 Facial and Body Treatments		
	30401	Aromatherapy/mist product
	***	Body or baby powder
	30403	Depilatory
	***	Hand and body conditioner, cream, and lotion
	***	Moisturizer
	30406	Self-tanning preparation
	30407	Skin colorant (including body paint)
	30408	Skin lightener
	30409	Skin protectant/lubricant/humectant
	30410	Spray-on stocking
	***	Sunscreen (hair or body)
	***	Suntan oil and lotion
	30499	Other facial and body treatments
30500 Fragrance Products		
	30501	**Deodorant body spray**
≤ 20%, pre 1/1/1994	30502	**Personal fragrance product** with 20% or less fragrance and first sold in CA prior to 1/1/1994
≤20%, 1/1/1994 - 1/1/1999	30503	**Personal fragrance product** with 20% or less fragrance and first sold in CA from 1/1/1994 to 1/1/1999

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
≤20%, post 1/1/1999	30504	**Personal fragrance product** with 20% or less fragrance and first sold after 1/1/1999
> 20%, pre 1/1/1994	30505	**Personal fragrance product** with more than 20% fragrance and first sold in CA prior to 1/1/1994
>20%, 1/1/1994 - 1/1/1999	30506	**Personal fragrance product** with more than 20% fragrance and first sold in CA from 1/1/1994 to 1/1/1999
>20%, post 1/1/1999	30507	**Personal fragrance product** with more than 20% fragrance and first sold after 1/1/1999
	30599	Other fragrance products
30600 Hair Care Products		
	***	Bleach and lightener
	***	Conditioner without styling claims
	***	Dye, permanent
	***	Dye, semi-permanent
	***	Dye, temporary
	***	**Hair shine**
	***	**Hair styling gel**
	***	**Hair styling product**
	30609	**Hair mousse**
	30610	**Hair spray**
	***	Hair tonic/hair restorer
	***	Permanent wave treatment
	***	Shampoo
	30614	Temporary hair color or glitter, aerosol
	***	Other hair care products
30700 Health Use Products (External Use Only)		
	***	Allergen control product
	***	Corn and callus removal product
	***	Ear drops
	***	Ear wipes
	***	External analgesic product
	***	Feminine hygiene cleanser
	***	Lice treatment/shampoo
	***	Liquid bandage product
	***	Personal lubricant
	30710	**Rubbing alcohol**
	***	Topical acne product
	30712	Topical anti-fungal product
	***	Wart removal product
	30714	Witch Hazel
	***	Other external health use products (including other external-use-only OTC drugs)
30800 Make-up Cosmetics (Select "Nail Care Products" to be reported in 30900)		
	***	Eyebrow pencil/powder
	***	Eyeliner

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
	***	Eye shadow
	***	Lipstick/lip gloss
	***	Makeup base, foundation, or fixative
	30806	Mascara
	***	Rouge or blush
	***	Other make-up cosmetics
30900 Nail Care Products		
	***	Artificial nail extension/elongation product
	***	Artificial nail, wrap, or nail glue remover
	30903	Base coat/undercoat
	***	Cuticle treatment product
	***	Nail glue or adhesive
	30906	Nail polish/lacquer/paint (reporting note: refer to definition of *product group* for grouping allowances)
	***	**Nail polish remover**
	***	Nail polish thinner
	***	Nail product drying enhancer
	30910	Nail treatment product
	30911	Top coat
	***	Other nail care products
31000 Oral Care Products		
	***	Canker sore/oral irritation products
	***	Denture adhesive
	***	Fluoride rinse
	***	Gum rejuvenator
	***	Liquid breath freshener/spray
	***	Mouthwash/rinse
	***	Plaque and tartar removal products
	***	Toothpaste, gel, polish, and powder
	***	Tooth sensitivity product
	***	Tooth whitening product
	***	Other oral care products
31100 Shaving Products		
	31101	Aftershave products
	31102	Electric shaver cleaning or lubricating product
	***	Preshave products
	31104	**Shaving cream (Aerosol)**
	31105	Shaving cream (Non-Aerosol)
	***	**Shaving gel (Aerosol)**
	31107	Shaving gel (Non-Aerosol)
	31108	Shaving soap
	31199	Other shaving products

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
40000 PESTICIDE PRODUCTS		
40100 Anti-microbial Agents		
	***	Sterilants
	***	Other antimicrobial agents; see also 20000 Household Products
40200 Fungicides and Nematicides		
	40201	Lawn and garden fungicide
	40202	Lawn and garden nematicide
	40203	Mold and mildew retardant
	40299	Other fungicides and nematicides
40300 Herbicides		
	40301	Algae control (non-aquatic)
	40302	Aquatic herbicide
	40303	Defoliant
	40304	Desiccant
	40305	Moss control products
	40306	**Non-selective terrestrial herbicide**
	40399	Other herbicides
40400 Insecticides and Repellents		
	40401	Animal repellent
	40402	Botanical insecticide
	***	**Crawling bug insecticide (aerosol)**
	40404	**Crawling bug insecticide (non-aerosol)**
	40405	Dust mite and allergen preventative
	40406	Dusting agent
	40407	**Flea and tick insecticide**
	***	**Flying bug insecticide (aerosol)**
	40409	**Flying bug insecticide (non-aerosol)**
	40410	Fumigants
	40411	Horticultural oil
	40412	Insecticidal soap
	40413	**Insecticide fogger**
	***	**Insect repellent**
	40415	**Lawn and garden insecticide (aerosol)**
	***	**Lawn and garden insecticide (non-aerosol)**
	40417	Mothballs
	40418	Pest baits and traps (not including exempted bait station insecticides)
	40419	Pest repellent candles
	40420	Pest strips or tape
	40421	Residual insecticides
	40422	Rodent poison or bait
	40423	Synergists
	***	**Wasp and hornet insecticide**
	40499	Other insecticides and repellents

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
60000 SOLVENT AND THINNING-RELATED PRODUCTS		
60100 Electronic-Related		
	***	**Anti-static product**
	***	**Electrical cleaner**
	***	**Electronic cleaner**
	***	**Energized electrical cleaner**
	60105	**Pressurized gas duster**
	60199	Other electronic-related cleaning products
60200 Miscellaneous Solvent and Thinning Products		
	60201	Brush cleaner and reconditioner
	60202	Clean up solvent
	60203	Specialty degreasers (specific use)
	60204	Denatured alcohol
	***	**Floor or wall covering adhesive remover**
	***	**Gasket or thread locking adhesive remover**
	60207	**General purpose adhesive remover**
	60208	**Graffiti remover**
	60209	Lacquer thinner
	60210	**Multi-purpose solvent** and remover
	***	**Paint remover or stripper**
	60212	**Paint thinners** and reducers
	60213	**Specialty adhesive remover**
	60214	Spray gun cleaner and solvent
	60215	Surface preparation solvent and cleaner (marine vessel and watercraft surfaces)
	60216	Surface preparation solvent and cleaner (motor vehicle surfaces)
	60217	Thinner/reducer/retardant (furniture coating systems)
	60218	Thinner/reducer/retardant (marine vessel and watercraft coating systems)
	60219	Thinner/reducer/retardant (motor vehicle coating systems)
	60220	Other adhesive remover
	60299	Other solvent and thinning products; see also 20000 Household Products
70000 VEHICLE AND MARINE VESSEL AFTERMARKET PRODUCTS		
70100 Detailing Products		
	***	All other forms of **Automotive wax/polish/sealant/glaze**
	***	**Automotive rubbing or polishing compound**
	***	**Automotive hard paste wax**
	70104	**Automotive instant detailer (pump sprays)**
	70105	Automotive wash or cleaner
	70106	**Bug and tar remover**
	70107	Paint and surface cleaner
	70108	Paint and surface protectants including antifouling products
	70109	Rubbing and polishing compound other than automotive
	70110	Scratch and swirl remover
	70111	Tire cleaner

*** Do not report products falling under this category; category is proposed for the 2005 survey.

	Survey Code	Category Name (ARB Defined Categories in **BOLD**)
	70112	**Undercoating (Report Aerosols only)**
	70113	Wax/polish/sealant/glaze other than automotive
	70114	Wheel cleaner
	70199	Other vehicle and marine vessel detailing products
70200 Maintenance and Repair Products		
	***	Additives for antifreeze
	n/a	Adhesives: *Report under 10000 Adhesives, Sealants and Related Products*
	***	Antifreeze
	70203	**Automotive brake cleaner**
	70204	**Automotive windshield washer fluid (Type "A" Areas)**
	70205	**Automotive windshield washer fluid (Non Type "A" Areas)**
	70206	Belt dressing
	70207	Body repair products (other than coatings)
	70208	Brake anti-squeal compound
	70209	Brake cleaner
	70210	**Carburetor or fuel-injection air intake cleaner**
	70211	**Engine degreaser**
	***	Engine starting fluid
	70213	**General purpose degreaser**
	70214	Home-use metal parts immersion wash
	70215	Mold and mildew retardant
	***	Oil additive
	70217	**Tire sealants and inflator**
	70218	Windshield deicer
	70219	Windshield washer fluid additive
	70220	Windshield water repellant
	70299	Other vehicle and marine vessel maintenance and repair products

*** Do not report products falling under this category; category is proposed for the 2005 survey.

ATTACHMENT B: STATUTE: DISCLOSURE OF PUBLIC RECORDS

Title 17 Air Resources Board
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 Section 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.

History

1. New Subchapter 4 (Sections 91000 through 91022, not consecutive) filed 1-26-73; effective thirtieth day thereafter (Register 73, No. 4).
2. Amendment filed 9-28-73; effective thirtieth day thereafter (Register 73, No. 39).
3. Amendment of NOTE filed 3-18-77; effective thirtieth day thereafter (Register 77, No. 12).
4. Repealer and new section filed 10-5-82; effective thirtieth day thereafter (Register 82, No. 41).

§ 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.

History

1. Amendment filed 9-28-73; effective thirtieth day thereafter (Register 73, No. 39)
2. Amendment and new NOTE filed 3-18-77; effective thirtieth day thereafter (Register 77, No. 12).
3. Repealer and new section filed 10-5-82; effective thirtieth day thereafter (Register 82, No. 41).

Article 2. Board's Request 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.

History

1. Amendment of subsections (a) and (b) filed 9-28-73; effective thirtieth day hereafter (Register 73, No. 39).
2. Amendment of subsection (a), (b) and (c), and new NOTE, filed 3-18-77; effective thirtieth day thereafter (Register 77, No.12).
3. Amendment filed 10-5-82; effective thirtieth day thereafter (Register 82, No. 41).
4. Editorial correction filed 5-7-84; effective thirtieth day thereafter (Register 84, No. 19).

§ 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.

History

1. New section filed 10-5-82; effective thirtieth day thereafter (Register 82, No. 41. For history of former section, see Register 73, No. 39.
2. Amendment filed 7-10-84; effective thirtieth day thereafter (Register 84, No. 28).

Article 3. Inspection of Public Records

§ 91020. Disclosure Policy .

History

Repealer filed 10-5-82; effective thirtieth day thereafter (Register 82, No. 41).

§ 91021. Disclosure Procedure.

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

History

1. Amendment of subsections (c) and (d)(3) filed 9-28-73; effective thirtieth day thereafter (Register 73, No. 39).
2. Amendment and new NOTE filed 3-18-77; effective thirtieth day thereafter (Register 77, No. 12).
3. Repealer filed 10-5-82; effective thirtieth day thereafter (Register 82, No. 41).

§ 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:
(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 the 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 that 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 of 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;
(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.

HISTORY

1. Amendment of subsections (a) and (b) filed 9-28-73; effective thirtieth day thereafter (Register 73, No. 39).
2. Amendment and new NOTE filed 3-18-77; effective thirtieth day thereafter (Register 77, No. 12).
3. Amendment filed 10-5-82; effective thirtieth day thereafter (Register 82, No. 41).
4. Editorial correction of subsection (a) filed 5-7-84; effective thirtieth day thereafter (Register 84, No.19).
5. Amendment filed 7-10-84; effective thirtieth day thereafter (Register 84, No. 28).

ATTACHMENT C: 2002 NAICS CODES

This list provides some of the more common North American Industry Classification System (NAICS) codes for the consumer products industry. This list is meant to be a guide to facilitate the survey process, however it is not all-inclusive. The most appropriate 2002 NAICS code(s) may not be listed here for your particular product, service, or business. You are encouraged to identify and respond with the most appropriate 2002 NAICS code(s) as provided by the U.S. Office of Management and Budget. For more information on the codes, visit the U.S. Census Bureau website: http://www.census.gov/epcd/www/naics.html

NAICS Code	North American Industry Classification System Title
	MANUFACTURING
311999	All Other Miscellaneous Food Manufacturing
324110	Petroleum Refineries
325110	Petrochemical Manufacturing
325132	Synthetic Organic Dye and Pigment Manufacturing
325181	Alkalies & Chlorine Manufacturing
325191	Gum and Wood Chemical Manufacturing
325199	All Other Basic Organic Chemical Manufacturing
325320	Pesticide and Other Agricultural Chemical Manufacturing
325412	Pharmaceutical Preparation Manufacturing
325520	Adhesive Manufacturing
325611	Soap & Other Detergent Manufacturing
325612	Polish & Other Sanitation Good Manufacturing
325620	Toilet Preparation Manufacturing
325998	All Other Miscellaneous Chemical Product & Preparation Manufacturing
326211	Tire Manufacturing (Except Retreading)
	WHOLESALE
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers
423130	Tire and Tube Merchant Wholesalers
423210	Furniture Merchant Wholesalers
423220	Home Furnishing Merchant Wholesalers
423420	Office Equipment Merchant Wholesalers
423430	Computer and Computer Peripheral Equipment and Software Merchant Wholesalers
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers
423620	Electrical and Electronic Appliance, Television, and Radio Set Merchant Wholesalers
423690	Other Electronic Parts and Equipment Merchant Wholesalers
423710	Hardware Merchant Wholesalers
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers
423840	Industrial Supplies Merchant Wholesalers
423850	Service Establishment Equipment and Supplies Merchant Wholesalers
423910	Sporting and Recreation Goods and Supplies Merchant Wholesalers
423920	Toy and Hobby Goods and Supplies Merchant Wholesalers
424120	Stationery and Office Supplies Merchant Wholesalers
424210	Drug and Druggists' Sundries Merchant Wholesalers
424320	Men's and Boys' Clothing and Furnishings Merchant Wholesalers

424330	Women's, Children's, and Infants' Clothing and Accessories Merchant Wholesalers
424340	Footwear Merchant Wholesalers
424410	General Line Grocery Merchant Wholesalers
424490	Other Grocery and Related Products Merchant Wholesalers
424610	Plastics Materials and Basic Forms and Shapes Merchant Wholesalers
424690	Other Chemical and Allied Products Merchant Wholesalers
424720	Petroleum and Petroleum Products Merchant Wholesalers
424910	Farm Supplies Merchant Wholesalers
424950	Paint, Varnish, and Supplies Merchant Wholesalers
	RETAIL
441110	New Car Dealers
441210	Recreation Vehicle Dealers
441221	Motorcycle Dealers
441222	Boat Dealers
441310	Automotive Parts and Accessories Stores
442110	Furniture Stores
442210	Floor Covering Stores
442291	Window Treatment Stores
443111	Household Appliance Stores
443112	Radio, Television, and Other Electronics Stores
443120	Computer and Software Stores
444110	Home Centers
444120	Paint and Wallpaper Stores
444130	Hardware Stores
444190	Other Building Material Dealers
444220	Nursery, Garden Center, and Farm Supply Stores
445110	Supermarkets and Other Grocery (except Convenience) Stores
445120	Convenience Stores
445299	All Other Specialty Food Stores
446110	Pharmacies and Drug Stores
446120	Cosmetics, Beauty Supplies, and Perfume Stores
446191	Food (Health) Supplement Stores
447110	Gasoline Stations with Convenience Stores
448110	Men's Clothing Stores
448120	Women's Clothing Stores
448130	Children's and Infants' Clothing Stores
448140	Family clothing Stores
448150	Clothing Accessories Stores
448190	Other Clothing Stores
448320	Luggage and Leather Goods Stores
451110	Sporting Goods Stores
451120	Hobby, Toy and Game Stores
451130	Sewing, Needlework, and Piece Goods Stores
452111	Department Stores (except Discount Department Stores)
452112	Discount Department Stores
452910	Warehouse Clubs and Supercenters
452990	All Other General Merchandise Stores
453998	All Other Miscellaneous Store Retails (except Tobacco Stores)
454111	Electronic Shopping
454113	Mail-Order Houses
454390	Other Direct Selling Establishments

ATTACHMENT D: U.S. RESIDENT POPULATION

If California direct sales data are not available for FORM 3, Item 12, sales may be estimated by prorating national or regional sales figures by population using population estimates from 2003, provided below.

Total population of the United States: 290,809,777.

STATE	POPULATION	%	RANK
Alabama	4,500,752	1.5	23
Alaska	648,818	0.2	47
Arizona	5,580,811	1.9	18
Arkansas	2,725,714	0.9	32
California	**35,484,453**	**12.2**	**1**
Colorado	4,550,688	1.6	22
Connecticut	3,483,372	1.2	29
Delaware	817,491	0.3	45
District of Columbia	563,384	0.2	(X)
Florida	17,019,068	5.9	4
Georgia	8,684,715	3.0	9
Hawaii	1,257,608	0.4	42
Idaho	1,366,332	0.5	39
Illinois	12,653,544	4.4	5
Indiana	6,195,643	2.1	14
Iowa	2,944,062	1.0	30
Kansas	2,723,507	0.9	33
Kentucky	4,117,827	1.4	26
Louisiana	4,496,334	1.5	24
Maine	1,305,728	0.4	40
Maryland	5,508,909	1.9	19
Massachusetts	6,433,422	2.2	13
Michigan	10,079,985	3.5	8
Minnesota	5,059,375	1.7	21
Mississippi	2,881,281	1.0	31
Missouri	5,704,484	2.0	17

STATE	POPULATION	%	RANK
Montana	917,621	0.3	44
Nebraska	1,739,291	0.6	38
Nevada	2,241,154	0.8	35
New Hampshire	1,287,687	0.4	41
New Jersey	8,638,396	3.0	10
New Mexico	1,874,614	0.6	36
New York	19,190,115	6.6	3
North Carolina	8,407,248	2.9	11
North Dakota	633,837	0.2	48
Ohio	11,435,798	4.0	7
Oklahoma	3,511,532	1.2	28
Oregon	3,559,596	1.2	27
Pennsylvania	12,365,455	4.3	6
Rhode Island	1,076,164	0.4	43
South Carolina	4,147,152	1.4	25
South Dakota	764,309	0.3	46
Tennessee	5,841,748	2.0	16
Texas	22,118,509	7.6	2
Utah	2,351,467	0.8	34
Vermont	619,107	0.2	49
Virginia	7,386,330	2.5	12
Washington	6,131,445	2.1	15
West Virginia	1,810,354	0.6	37
Wisconsin	5,472,299	1.9	20
Wyoming	501,242	0.2	50

X = Not Applicable

Source: U.S. Census Bureau
http://www.census.gov/statab/ranks/rank01.txt

ATTACHMENT E: LVP-VOCS TO BE INDIVIDUALLY REPORTED

The materials on this list are to be individually reported on FORM 4 in the Speciation Table. This list should NOT be considered a complete list of *LVP-VOCs*, as it represents only a subset of materials that qualify as *LVP-VOCs*. *LVP-VOC* status of the materials on this list has not necessarily been validated by the ARB, and inclusion on this list is based on information provided by manufacturers or information publicly available. "Trade Names" are included to assist you, but not all "Trade Names" for a given material may be listed.

This list does not include materials that may be *partial LVP-VOCs*. All *partial LVP-VOCs* are to be reported on FORM 4 in the Speciation Table.

Materials qualifying as *LVP-VOCs* that do not appear on this list (other than *partial LVP-VOCs)* should be grouped under "Group other LVP-VOCs" as shown on FORM 4 below the Speciation Table.

Compound Name	CAS #	Trade Names	Producers
1,3-Butanediol	107-88-0		
1,4-Butanediol	110-63-4		Penreco
1,5-Pentanediol	111-29-5		Penreco
1-Tetradecene	1120-36-1		Chevron Phillips
2-Pyrrolidone	616-45-5		Penreco
2,2,4-Trimethyl-1,3-Pentanediol Isobutyrate	25265-77-4	Texanol™	Eastman
2-Butoxy-1-Propanol	15821-83-7		
2-Methyl-2,4-Pentanediol	107-41-5	Hexylene Glycol	
Alkyl C16-C18 Methyl Esters	67784-80-9	Steposol®, Methyl Soyate	Stepan Products
Dibasic Ester	NA	DBE-3	
Dibutyl Phthalate	84-74-2		Aristec, Eastman, Unitex Chem. Cos
Diethanolamine	111-42-2		
Diethyl Phthalate	84-66-2		Eastman, Unitex Chem. Cos
Diethylene Glycol	111-46-6		
Diethylene Glycol Mono(2-Ethylhexyl) Ether	1559-36-0		
Diethylene Glycol Monobutyl Ether	112-34-5	Butyl Carbitol®, Dowanol DB® Glycol Ether DB® Eastman DB® Solvent Butyl Dioxitol®	Dow Lyondell/Equistar Eastman Shell
Diethylene Glycol Monoethyl Ether Acetate	112-15-2	Eastman DE Acetate®	Eastman
Diethylene Glycol Monohexyl Ether	112-59-4	Hexyl Carbitol®	Dow
Diethylene Glycol n-Butyl Ether Acetate	124-17-4	Butyl Carbitol Acetate® Glycol Ether DBA® Eastman DB Acetate®	Dow Lyondell/Equistar Eastman
Diethylene Glycol Propyl Ether	6881-94-3	Eastman DP Solvent®	Eastman
Diisopropyl Adipate	6938-94-9		
Dimethyl Adipate	627-93-0		
Dimethyl Glutarate	1119-40-0		
Dimethyl Phthalate	131-11-3		

*See Attachment F for bin numbers for *hydrocarbon solvents.*

Compound Name	CAS #	Trade Names	Producers
Dipropylene Glycol	25265-71-8	DPG	
Dipropylene Glycol Methyl Ether Acetate	88917-22-0	Dowanol DPMA® Arcosolv DPMA®	Dow Lyondell/Equistar
Dipropylene Glycol n-Butyl Ether	29911-28-2	Dowanol DPnB® Arcosolv DPnB®	Dow Lyondell/Equistar Arch
Dipropylene Glycol n-Propyl Ether	29911-27-1	Dowanol DPnP® Arcosolv DPnP®	Dow Lyondell/Equistar
Dipropylene Glycol Phenyl Ether	51730-94-0		
Ethylene Glycol	107-21-1		
Ethylene Glycol Ester	94944-95-3		
Ethylene Glycol Monohexyl Ether	112-25-4	Hexyl Cellusolve®	Dow
Ethylene Glycol Phenyl Ether	122-99-6	Dowanol EPh®	Dow
Hydrocarbon Solvent*	N/A	Aromatic 200	Chem Central, ExxonMobil
Hydrocarbon Solvent*	N/A	C1316 Paraffin	Sasol North America
Hydrocarbon Solvent*	N/A	CITGO Mineral Seal Oil	CITGO
Hydrocarbon Solvent*	N/A	Conosol® 215	Penreco
Hydrocarbon Solvent*	N/A	Conosol® 260	Penreco
Hydrocarbon Solvent*	N/A	Conosol® 340	Penreco
Hydrocarbon Solvent*	N/A	Conosol® C-200	Penreco
Hydrocarbon Solvent*	N/A	Conosol® 38V	Penreco
Hydrocarbon Solvent*	N/A	Conosol® 46V	Penreco
Hydrocarbon Solvent*	N/A	Conosol® 50V	Penreco
Hydrocarbon Solvent*	N/A	Conosol® C-170	Penreco
Hydrocarbon Solvent*	N/A	Conosol® HDW	Penreco
Hydrocarbon Solvent*	N/A	Drakesol® 205	Penreco
Hydrocarbon Solvent*	N/A	Drakesol® 220	Penreco
Hydrocarbon Solvent*	N/A	Drakesol® 260	Penreco
Hydrocarbon Solvent*	N/A	Drakesol® 305	Penreco
Hydrocarbon Solvent*	N/A	Exxsol® D 110	ExxonMobil
Hydrocarbon Solvent*	N/A	Exxsol® D 130	ExxonMobil
Hydrocarbon Solvent*	N/A	Exxsol® D 95	ExxonMobil
Hydrocarbon Solvent*	N/A	Isopar® M	ExxonMobil
Hydrocarbon Solvent*	N/A	Isopar® V	ExxonMobil
Hydrocarbon Solvent*	N/A	LINPAR®1416 –V Paraffin	Sasol North America
Hydrocarbon Solvent*	N/A	LPA® –170 Solvent	Sasol North America
Hydrocarbon Solvent*	N/A	LPA® –210 Solvent	Sasol North America
Hydrocarbon Solvent*	N/A	LVP 100	Calumet Lubricants
Hydrocarbon Solvent*	N/A	LVP 200	Calumet Lubricants
Hydrocarbon Solvent*	N/A	LVP 300	Calumet Lubricants
Hydrocarbon Solvent*	N/A	LVP 400	Calumet Lubricants
Hydrocarbon Solvent*	N/A	Norpar® 13	ExxonMobil
Hydrocarbon Solvent*	N/A	Norpar® 14	ExxonMobil
Hydrocarbon Solvent*	N/A	Norpar® 15	ExxonMobil
Hydrocarbon Solvent*	N/A	PD-23	Crompton Witco Refined Products

*See Attachment F for bin numbers for *hydrocarbon solvents*.

Compound Name	CAS #	Trade Names	Producers
Hydrocarbon Solvent*	N/A	PD-26	Crompton Witco Refined Products
Hydrocarbon Solvent*	N/A	PD-28	Crompton Witco Refined Products
Hydrocarbon Solvent*	N/A	Soltrol® 170	Chevron Phillips
Hydrocarbon Solvent*	N/A	Soltrol® 220	Chevron Phillips
Isohexadecane (Heptamethylnonane)	4390-04-9		
N,N'-Diethyl-m-Toluamide and Isomers (DEET)	134-62-3	DEET	
Oxo-Decyl Acetate	108419-34-7	Exxate® 1000	ExxonMobil
Oxo-Dodecyl Acetate	108419-34-8	Exxate® 1200	ExxonMobil
Phthalic Anhydride	85-44-9		
Propylene Glycol	57-55-6		
Propylene Glycol Phenyl Ether	770-35-4	Dowanol PPh®	Dow
Triethanolamine	102-71-6		
Triethylene Glycol	112-27-6		
Triethylene Glycol Mono(2-Ethylhexyl) Ether	1559-37-1		
Triethylene Glycol Monobutyl Ether	143-22-6	Butoxytriglycol® Glycol Ether TB® Eastman DTB Solvent®	Shell Lyondell/Equistar Eastman Dow
Triethylene Glycol Monoethyl Ether	112-50-5	Ethoxytriglycol® Eastman DTE Solvent® Glycol Ether TE®	Dow Eastman Lyondell/Equistar
Triethylene Glycol Monomethyl Ether	112-35-6	Methoxytriglycol® Glycol Ether TM®	Dow Lyondell/Equistar Arch
Triisopropanolamine	122-20-3		
Tripropylene Glycol	24800-44-0		
Tripropylene Glycol Methyl Ether	25498-49-1	Dowanol TPM® Arcosolv TPM®	Dow Lyondell/Equistar
Tripropylene Glycol n-Butyl Ether	55934-93-5	Dowanol TPnB® Arcosolv TPnB®	Dow Lyondell/Equistar
Tripropylene Glycol n-Propyl Ether	96077-04-2	Dowanol TPnP®	Dow

*See Attachment F for bin numbers for *hydrocarbon solvents*.

ATTACHMENT F: HYDROCARBON SOLVENT INFORMATION

The hydrocarbon solvent materials on this list are to be individually reported on FORM 4 in the Speciation Table. This list is provided to help you fill in the FORM 4 fields "Trade Name & Manufacturer" and "Bin #." This list should NOT be considered a complete list of hydrocarbon solvent materials. Custom blends are NOT represented. Trade names and bin numbers on this list are based on information provided by manufacturers or information publicly available and have not been verified by ARB staff. If you do not see your hydrocarbon solvent listed OR if you have a hydrocarbon solvent custom blend, you MUST obtain the trade name and corresponding bin number from your supplier or manufacturer and report them on FORM 4.

Manufacturer / Trade Name	Bin #
American Refining Group	
Kensol 30	15
Ashland, Incorporated	
142 Solvent 66	11
Hi Sol® 10	22
Hi Sol® 15	23
Kwik-Dri®	6
Lacolene®	6
Low Odor Base Solvent®	16
Mineral Spirits 66 (1% Aromatic)	11
Mineral Spirits 66 (7.5% Aromatic)	14
Mineral Spirits NE	15
Odorless Mineral Spirits	12
VM&P Naphtha	6
Xylenes	21
Calumet Lubricants	
142 Flash	11
Calprint 35	16
Calprint 38	16
Calprint 600 Solvent	20
Hexane	1
Iso-Hexane	2
LVP 100	11
LVP 200	16
LVP 300	16
LVP 400	20
Mineral Spirits	15
Mineral Spirits (<1%)	11
VM&P (<1%)	6
Chemcentral	
Aromatic 100	22
Aromatic 150	23
Aromatic 200	24
Xylenes	21
140 Solvent	11
Heptane	1
Hexane	1

Manufacturer / Trade Name	Bin #
Chemcentral (continued)	
Mineral Spirits	15
Odorless Mineral Spirits	11
VM&P Naphtha	6
Chevron Phillips Chemical Company	
Soltrol® 10 Fluid	7
Soltrol® 100 Fluid	7
Soltrol® 130 Fluid	12
Soltrol® 170 Fluid	11
Soltrol® 220 Fluid	16
CITGO	
142 Solvent 66/3	11
170 Solvent	11
Camping Fuel	4
Citgo Mineral Seal Oil	19
Heptane	2
Hexane	1
Lactol Spirits	10
Mineral Spirits 150	11
Mineral Spirits 66/3	11
Mineral Spirits 75	9
Naphthol Spirits 66/3	6
Regular Mineral Spirits	15
Roto Solv	9
Rubber Solvent	4
Solv G	23
Special Lactolite	6
Special Naphtholite 66/3	6
Super Hi Flash Naphtha	22
Textile Spirits	1
Xylenes	21
Conoco Phillips	
Pentanes	1
Hexanes	1
Iso-hexanes	2
Heptanes	1

Manufacturer / Trade Name	Bin #
Crompton Witco Refined Products	
PD-23	17
PD-26	17
PD-28	17
Exxonmobil Chemical Company	
1520 Naphtha	1
2024 Naphtha	9
Aromatic 100 Fluid	22
Aromatic 150 Fluid	23
Aromatic 200 Fluid	24
Exxsol® D110 Fluid	16
Exxsol® D130 Fluid	16
Exxsol® D3135 Naphtha	6
Exxsol® D40 Fluid	11
Exxsol® D80 Fluid	11
Exxsol® D95 Fluid	N/A*
Exxsol® DSP 75/100 Naphtha	1
Exxsol® DSP 115/145 Naphtha	6
Exxsol® Hexane Fluid	2
Exxsol® Heptane Fluid	2
Exxsol® Methylpentane Naphtha	2
Isopar® C Fluid	7
Isopar® E Fluid	7
Isopar® G Fluid	7
Isopar® H Fluid	12
Isopar® K Fluid	12
Isopar® K Naphtha	12
Isopar® L Fluid	11
Isopar® M Fluid	16
Isopar® V Fluid	16
Norpar® 12 Fluid	12
Norpar® 13 Fluid	12
Norpar® 14 Fuid	17
Norpar® 15 Fluid	17
OMS	12
RS Naphtha	5
Varsol® 1 Fluid	15
Varsol® 1 Naphtha	15
Varsol® 110 Fluid	20
Varsol® 140 Naphtha	15
Varsol® 18 Fluid	14
Varsol® 18 Naphtha	9
Varsol® 3135 Naphtha	10
Varsol® DX 140 Naphtha	14
Xylenes	21
Flint Hills Resources	
Sure-Sol® 100	22
Sure-Sol® 150	23
Sure-Sol® 150ND	23
Xylenes	21

Manufacturer / Trade Name	Bin #
Gary-Williams Energy Corporation	
100W	15
Marathon Ashland Petroleum LLC	
90 Solvent	6
142 Solvent	11
Kwik-Dri®	6
Lacolene®	6
Low Odor Base Solvent®	16
Mineral Spirits Rule 66	11
Non-Exempt Mineral Spirits	15
VM&P Naphtha	6
Penreco	
Conosol® 215	16
Conosol® 260	16
Conosol® 340	16
Conosol® 38V	16
Conosol® 46V	16
Conosol® 50V	16
Conosol® 90	11
Conosol® C-145	13
Conosol® C-170	13
Conosol® C-200	18
Conosol® HDW	16
Drakesol® 165	11
Drakesol® 205	16
Drakesol® 220	16
Drakesol® 260	16
Drakesol® 305	16
Magiesol® 38LX	13
Magiesol® 40	11
Magiesol® 44	16
Magiesol® 47	16
Magiesol® 47LX	18
Magiesol® 52	16
Magiesol® 55LX	16
Magiesol® 60	16
Magiesol® 65LX	16
Penreco® 144ES	14
Penreco® 150-B	15
Penreco® 170ES	14
Penreco® LVT200	18
Sasol North America, Incorporated	
C1316 Paraffin	17
LINPAR® 1416-V Paraffin	17
LPA® Solvent	11
LPA®-142 Solvent	11
LPA®-150 Solvent	11
LPA®-170 Solvent	11
LPA®-210 Solvent	16

Manufacturer / Trade Name	Bin #
Sasol North America, Incorporated (continued)	
LPA®-210 Solvent	16
MR Solvent	15
ODC® Solvent	11
ODC®-15 Solvent	15
Sasol® 47 Solvent	16
Shell Chemicals	
Heptane - Cotton Valley	1
Heptane – Lemont	2
SHELLSOL® 15	15
SHELLSOL® 16	15
SHELLSOL® 7EC	14
SHELLSOL® 9	15
SHELLSOL® A100	22
SHELLSOL® A150	23
SHELLSOL® B HT	1
SHELLSOL® D38	6
SHELLSOL® D40	11
SHELLSOL® D43	11
SHELLSOL® D60	11
SHELLSOL® D80	11

Manufacturer / Trade Name	Bin #
Shell Chemicals (continued)	
SHELLSOL® OMS	12
SHELLSOL® TC	7
SHELLSOL® W HT	6
VM&P Naphtha	6
Whitaker Oil Company	
142 Flash Solvent (D-60)	11
Aromatic 100	22
Aromatic 150	23
Heptane	2
Hexane	1
LPA® 142 Solvent	11
LPA® 170 Solvent	11
LPA® 210 Solvent	16
LPA® Solvent	11
Mineral Spirits (D-38)	6
Mineral Spirits, Odorless	12
Mineral Spirits, Rule 66 (D-40)	11
Rubber Solvent	4
VM&P Naphtha HT	6
Xylenes	21

*No Bin number needed, report only Trade Name and Manufacturer.

ATTACHMENT G: REACTIVITY BIN NUMBERS

Aliphatic and aromatic hydrocarbon solvent tables were obtained from the California Consumer Products Regulation, Title 17, California Code of Regulations, Subchapter 8.6, Article 1, Section 94701.

ALIPHATIC HYDROCARBON SOLVENTS

Bin	Average Boiling Point*** (degrees F)	Criteria	MIR Value
1	80-205	Alkanes (< 2% Aromatics)	2.08
2	80-205	N- & Iso-Alkanes (≥ 90% and < 2% Aromatics)	1.59
3	80-205	Cyclo-Alkanes (≥ 90% and < 2% Aromatics)	2.52
4	80-205	Alkanes (2 to < 8% Aromatics)	2.24
5	80-205	Alkanes (8 to 22% Aromatics)	2.56
6	>205-340	Alkanes (< 2% Aromatics)	1.41
7	>205-340	N- & Iso-Alkanes (≥ 90% and < 2% Aromatics)	1.17
8	>205-340	Cyclo-Alkanes (≥ 90% and < 2% Aromatics)	1.65
9	>205-340	Alkanes (2 to < 8% Aromatics)	1.62
10	>205-340	Alkanes (8 to 22% Aromatics)	2.03
11	>340-460	Alkanes (< 2% Aromatics)	0.91
12	>340-460	N- & Iso-Alkanes (≥ 90% and < 2% Aromatics)	0.81
13	>340-460	Cyclo-Alkanes (≥ 90% and < 2% Aromatics)	1.01
14	>340-460	Alkanes (2 to < 8% Aromatics)	1.21
15	>340-460	Alkanes (8 to 22% Aromatics)	1.82
16	>460-580	Alkanes (< 2% Aromatics)	0.57
17	>460-580	N- & Iso-Alkanes (≥ 90% and < 2% Aromatics)	0.51
18	>460-580	Cyclo-Alkanes (≥ 90% and < 2% Aromatics)	0.63
19	>460-580	Alkanes (2 to < 8% Aromatics)	0.88
20	>460-580	Alkanes (8 to 22% Aromatics)	1.49

***Average Boiling Point = (Initial Boiling Point + Dry Point) / 2

AROMATIC HYDROCARBON SOLVENTS

Bin	Boiling Range (degrees F)	Criteria	MIR Value
21	280-290	Aromatic Content (≥98%)	7.37
22	320-350	Aromatic Content (≥98%)	7.51
23	355-420	Aromatic Content (≥98%)	8.07
24	450-535	Aromatic Content (≥98%)	5.00

PART VI:
Samples of Completed Forms

SAMPLE #1: LICKETY SPLIT ADHESIVE REMOVER

To provide help in understanding the following sample forms, this section provides some general information about Product Sample #1.

Background

The Company: Household Saver, Inc. (HSI) is a subsidiary of Clever Brands that manufactures various types of *consumer products*. HSI is submitting information for ten of their products and holds the ingredient information for all of them.

The Product. Lickety Split Adhesive Remover is a general purpose adhesive remover, according to the *principal display panel*. Although HSI has submitted 10 products, only one product, identified by tracking #3, has been included for detail in this sample.

Notable Form Details

Some items from the forms are detailed here for clarity.

FORM 1 – Responsible Party Information

- A *parent company*, Clever Brands, is listed in Item 2 because HSI is not independently owned.
- Two NAICS codes are provided because HSI manufactures products that fall under two different NAICS product categories.
- Both manufacturer/marketer and contract packager are checked because HSI is involved in both types of businesses.
- A management-level representative has certified this submission.

FORM 2 – Source of Ingredient Information

- "No" has been checked because HSI holds all the ingredient information about their products and therefore will not use a *formulator*.

FORM 3 – Product Information

- Only the manufacturer/marketer box is checked for this product, because HSI does not contract package for this particular product.
- In Item 12, the "Product Size" does not match the "Volume/Mass Filled" because this product is overfilled by 2% or more. The density or specific gravity is not needed because the product is sold by mass (wt oz).

FORM 4 – Ingredient Information

- Section B is not completed because HSI did not send this form to a formulator; HSI completed their own ingredient information.
- In the Speciation Table, one ingredient is a *hydrocarbon solvent*, so the trade name, *manufacturer*, and bin number has been listed, in addition to the chemical names and CAS numbers.

Note

It is assumed that HSI sent the "Preliminary Form: Who Must Complete the Survey?" ahead of time. HSI also submitted a product *label*, Confidential Information Form, and Voluntary Survey Evaluation with these forms, however they are not included in this sample.

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FORM 1 – Responsible Party Information

(Instructions for completing FORM 1: See back side)

1. **Company Name:** Household Saver, Inc.
Division Name(s): Cleaning Products Division
Mailing Address: 1750 Regal Garden Pkwy, Suite A
City: Penfield **State:** KY **Zip:** 42706
Webpage: www.householdsaverinc.com

2. **Parent Company Name** (if applicable): Clever Brands
Mailing Address: 1305 Commerce Ct.
City: Lincoln **State:** GA **Zip:** 30723
Webpage: www.cb.net

3. **Contact Person:** George Alexandrea **Phone:** (270) 555-0757 **Fax:** (270) 555-3355
Title: Regulatory Affairs Associate **Email:** galex@hhs.com

4. **NAICS Code(s):** (see Attachment C for common codes) 325612 | 325520 | | | |

5. **Number of products:** (enter total number of products and/or *product groups* submitted) 10

6. Type of Business (check (✔) all that apply)	7. Gross Annual Receipts *For Calendar Year 2003* (check (✔) one)	8. Employees *For Calendar Year 2003*		9. Contract Employees *For Calendar Year 2003*	
		Worldwide (check (✔) one)	California Only (check (✔) one)	Worldwide (check (✔) one)	California Only (check (✔) one)
☒ Manufacturer/ Marketer	☐ Less than $250,000	☐ None	☒ None	☒ None	☒ None
☐ Distributor	☐ Between $250,000 and $1 million	☐ 1 to 10	☐ 1 to 10	☐ 1 to 10	☐ 1 to 10
☐ Retailer	☐ Between $1 million and $10 million	☐ 11 to 100	☐ 11 to 100	☐ 11 to 100	☐ 11 to 100
☒ Contract Packager	☒ Between $10 million and $50 million	☒ 101 to 250	☐ 101 to 250	☐ 101 to 250	☐ 101 to 250
☐ Other (specify):	☐ Between $50 million and $100 million	☐ 251 to 500	☐ 251 to 500	☐ 251 to 500	☐ 251 to 500
	☐ Between $100 million and $1 billion	☐ 501 to 750	☐ 501 to 750	☐ 501 to 750	☐ 501 to 750
	☐ More than $1 billion	☐ More than 750	☐ More than 750	☐ More than 750	☐ More than 750

10. **Comments:**

11. **Certification:** I am an authorized representative (management level) of the *responsible party* listed above and certify that all information submitted in this survey is complete, true, and correct.
Name: Carmen Lindsay **Title:** Director, Regulatory Affairs
Signature: Carmen Lindsay **Date:** 1/7/05

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Check (✔) if Confidential ☒

FORM 2 – Source of Ingredient Information

(Instructions for completing FORM 2: See back side)

Will your company be using a *formulator*? Check (✔) "no" or "yes" and complete the blanks as indicated.

☒ **No, my company,** Household Saver, Inc., **the *responsible party*, will not be using a *formulator* to complete ingredient information for any product or *product group* submitted for this survey.**

– OR –

☐ **Yes, my company, _____, the *responsible party*, will be using a *formulator* to complete ingredient information for one or more products submitted for this survey.** *List formulator contact information below; photocopy sheet as needed.*

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____

_____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Formulator Contact Name: _____

Title: _____

Phone: _____ **Fax:** _____

Email: _____

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____

_____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Formulator Contact Name: _____

Title: _____

Phone: _____ **Fax:** _____

Email: _____

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____

_____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Formulator Contact Name: _____

Title: _____

Phone: _____ **Fax:** _____

Email: _____

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FORM 3 – Product Information

(Instructions for completing FORM 3: See back side)

Product Tracking #: 3

1. Full Product Name: Lickety Split Adhesive Remover

2. Company Name: Household Saver, Inc.

3. ARB Category Code(s) Primary Category Code: 60207 *If applicable*, Additional Category Code(s):

4. Product Groups
Does this product represent a *product group*? ☐ yes ☒ no
If yes, list individual products on "Supplement to FORM 3".
Also specify which attribute(s) were used to group the products: ☐ Color ☐ Fragrance ☐ Size ☐ Botanical/herbal extract

5. Delivery/ Packaging System check (✔) one
- ☐ wipes/towels/cloths/sheets/pads
- ☒ pressurized aerosol container
- ☐ non-pressurized pump system (i.e. spray, foam, liquid)
- ☐ barrier pack or compartmentalized dispenser
- ☐ jar/can/tub/pourable bottle
- ☐ squeeze tube or squeeze bottle
- ☐ other (specify): _____

6. Dispensed Form check (✔) one
- ☐ post-foaming gel
- ☐ foam/mousse
- ☐ liquid
- ☐ semisolid
- ☐ solid
- ☒ mist/dispersed spray
- ☐ other (specify): _____

7. Relation to Product check (✔) all that apply
- ☒ Manufacturer/ Marketer
- ☐ Distributor
- ☐ Retailer
- ☐ Contract Packager
- ☐ Other (specify): _____

8. Customer Type check (✔) all that apply
- ☒ Household 60 %
- ☒ Commercial/ Institutional 40 %
- ☐ Industrial _____ %

total must = 100%

9. Dilution Ratios
Is this product sold as a *concentrate*? ☐ yes ☒ no
If yes, complete the dilution ratio table below.
Also specify the *diluent*: _____

	Product		Diluent	
Dilution:	*amount*	*units*	*amount*	*units*
least dilute				
most dilute				

10. Sales Data Collection Method check (✔) one
- ☒ Used CA-specific sales data
- ☐ Estimated by prorating data
  Specify "national", "regional", "distribution centers" or other: _____
- ☐ Other collection method used (specify): _____

11. General Information
- Is this a *pet care product*? ☐ yes ☒ no
- Is this a FIFRA registered product? ☐ yes ☒ no
- Is this product regulated by the FDA as an OTC drug? ☐ yes ☒ no
- Does this product contain a resin, polymer, or other film-forming compound? ☐ yes ☒ no

12. 2003 California Sales Data: complete for each size sold *(for wipes/towels and barrier packs see instructions)*

	Product Size (from label)	Volume/Mass filled (include *overfill* of 2% or more)	Units (wt oz or fl oz)	Qty Sold	Liquids (fl oz) only: Density (units) -OR- Specific Gravity	
#1	7	7.14	wt oz	67,329		
#2	10	10.61	" — "	106,152		
#3	20	20.40	" — "	8,463		
#4						
#5						
#6						

13. Comments: _____

LABELS: Submit one entire representative *label* for this product or *product group*.
Check (✔) one: ☒ Label attached or submitted electronically, **OR** ☐ Label submitted in 2001 Survey; 2001 Survey Product Tracking #: _____ *(required for this response)*

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Supplement to FORM 3 – Product Group Details

Product Tracking #: 3

The table below has been provided *only* for those companies that have grouped products together for the purposes of this survey (see FORM 3, Item 4).

1. Copy the following from FORM 3:
   - Company Name: Household Saver, Inc.
   - Full product name representing this *product group*: Lickety Split Adhesive Remover
   - Product Tracking #: *place in box, upper right corner of this page.*

2. Complete the following columns according to the method used to group the products (by color, *fragrance*, botanical/herbal extract, and/or size), which is also indicated by checking the attribute box(es) on FORM 3. Submit one completed copy of this page for each FORM 3 that represents a *product group.*

Individual Product Name	**Color** (if applicable)	**Fragrance/ Botanical or herbal extract** (if applicable)	**Size and units** (if applicable)
Lickety Split Adhesive Remover			7 wt oz
Lickety Split Adhesive Remover			10 wt oz
" ——— "			20 wt oz
More products to list? Photocopy this page as needed.			

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FORM 4 – Ingredient Information

(Instructions for completing FORM 4: See back side)

Product Tracking #: 3

A. PRODUCT NAME & RESPONSIBLE PARTY COMPANY NAME – *To be completed by the responsible party; copy from corresponding FORM 3.*

Full Product Name: Lickety Split Adhesive Remover

Company Name: Household Saver, Inc.

B. RESPONSIBLE PARTY CONTACT INFORMATION – *Only needed when responsible party is sending this form to a formulator for completion of Part C.*

Contact Person: _____ Phone: _____ Fax: _____

Title: _____ Email: _____

C. INGREDIENTS – *To be completed by the company that holds the ingredient information (either the responsible party or formulator).*

1. Specific Ingredient Table: Indicate the weight percent (Wt. %) of the following compounds that are contained in the product.

HFC-134a	1,1,1-Trichloroethane	Parachlorobenzotrifluoride	AMP	Perchloroethylene	Paradichlorobenzene	Naphthalene	Nitrogen	Menthol

HCFC-141b	Methylene Chloride	Volatile Methyl Siloxanes	HFC-152a	Acetone	Methyl Acetate	Carbon Dioxide	Water	C1 % Subtotal
	39.7							= 39.7 C1

2. Speciation Table: List all *VOCs, partial LVP-VOCs* and *LVP-VOCs* (see Attachment E for "LVP-VOCs to be Individually Reported") that comprise at least 0.1 Wt. %. Group other *LVP-VOCs* (those not listed individually), other exempts (those not listed above), other inorganics (those not listed above), all fragrance, and all *VOCs* that *individually* comprise less than 0.1 Wt. %, as indicated in each line-item entry below.

	Chemical Name	CAS Number	Trade Name & Manufacturer*	Bin #*	Weight %
1	C_{10} - C_{15} saturated Hydrocarbons	64742-47-8	Synergel SA 200 - Penreco	14	20.0
2	Isopropyl Alcohol	67-63-0			5.3
3	Isobutane	75-28-5			20.0
4	Propane	74-98-6			15.0
5					
6					
7					
8					

If more lines are needed, list additional ingredients on a separate page; enter the weight percent subtotal from that page on this line: =

Group other *LVP-VOCs* (those not listed individually above): **Group Total** =

Group other exempts (those not listed in item C1): **Group Total** =

Group other inorganics (those not listed in item C1): **Group Total** =

Group all Fragrance: **Group Total** =

Group *VOCs* that are *each* less than 0.1 Wt. %: **Group Total** =

Section C2 % Subtotal = 60.3 C2

Grand Total *(Sections C1 + C2 must = 100%)* = 100.0

3. *Ingredient Contact Information*

Completed By: George Alexandrea

Title: Reg. Aff. Associate **Phone:** (270)555-0757 **Email:** galex@hhs.com

Formulating Company: Household Saver, Inc. **Date:** 1/4/05

*Completion of these columns is required only if the ingredient is a *hydrocarbon solvent*, such as mineral spirits; otherwise these columns are optional. See instructions for details and Attachment F for a list of trade names and bin numbers.

Questions? Visit www.arb.ca.gov/consprod/regact/2003surv/2003surv.htm

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SAMPLE #2: 3 IN 1 NAIL MIRACLE

To provide help in understanding the following sample forms, this section provides some general information about Product Sample #2.

Background

The Company. Cornstarch Beauty Products, Inc. (CBP) is a retailer owned by a *parent company*, Total Beauty International, Inc. CBP will be using two different companies (*formulators*) to complete ingredient information for 7 of their 36 products being submitted for this survey. Although CBP has submitted 36 products, only one product, #4, has been included in detail for this sample.

The Product. 3 in 1 Nail Miracle (Nail Miracle) comes in twenty colors and is described on the *label* as a base coat, top coat and polish all in one.

Notable Form Details

Some items from the forms are detailed here for clarity.

FORM 2 – Source of Ingredient Information

- "Yes" was checked because CBP does not hold the ingredient information for all of the 36 products being submitted. Nail Products, USA, Inc. holds the ingredient information for Product Tracking #4, Nail Miracle, as well as, products #8 and #20. Beauty Chemistry holds ingredient information for tracking numbers 2, 7, 21 and 22.
- CBP holds the ingredient information for the remaining product tracking numbers not shown on this form.

FORM 3 – Product Information

- A primary category code and two additional category codes have been listed because Nail Miracle has multiple-use claims on the *principal display panel.*
- Although Nail Miracle come in 20 colors, only 5 of them have been grouped under this tracking number because the others vary by more than 2% VOC content from these shades (see page III-5 for grouping requirements). The other 15 shades must be reported separately from the 5 that are grouped under product #4.
- Nail Miracle contains a resin, as denoted in Item 11.
- CBP submitted a *label* for this product in the 2001 Survey. The *label* has not changed at all (neither art nor language), so CBP has fulfilled the *label* submittal requirement. The appropriate box is checked and 2001 tracking number is provided for ARB staff.

Supplement to FORM 3 – Product Group Details

- Five individual colors, with two sizes each (for a total of 10 separate products) for Nail Miracle have been listed on the table because they were reported as a *product group* on FORM 3.

FORM 4 – Ingredient Information

- CBP completed Sections A and B, then forwarded the whole FORM 4 to their *formulator*, Nail Products, USA, Inc., who then completed the ingredient information in Section C.
- Darren Fletcher, Product Line Manager from the formulating company, completed the ingredient information and mailed FORM 4 directly to the ARB.
- Nail Miracle does not contain any *hydrocarbon solvents*; therefore, no trade names or *manufacturers* are listed.

Note

It is assumed that CBP sent the "Preliminary Form: Who Must Complete the Survey?" ahead of time. CBP also submitted a product *label*, Confidential Information Form, and Voluntary Survey Evaluation with these forms, however they are not included in this sample.

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STATIONARY SOURCE DIVISION, AIR QUALITY MEASURES BRANCH

Check (✔) if Confidential ☒

FORM 1 – Responsible Party Information

(Instructions for completing FORM 1: See back side)

1. **Company Name:** Cornstarch Beauty Products, Inc.
   Division Name(s):
   Mailing Address: 12753 Richards St.
   City: Rhodes **State:** NY **Zip:** 10001
   Webpage: www.tbinternational.net/cornstarch

2. **Parent Company Name** (if applicable): Total Beauty International, Inc.
   Mailing Address: 1000 Maine Ave, Suite 300
   City: Minneapolis **State:** MN **Zip:** 55401
   Webpage: www.tbinternational.net

3. **Contact Person:** Fred Macleod **Phone:** (347)555-8316 **Fax:** (347)555-5634
   Title: Vice President of Marketing **Email:** macleodf@tbinternational.net

4. **NAICS Code(s):** (see Attachment C for common codes) 446120 | 446191 | 448310 | | |

5. **Number of products:** (enter total number of products and/or *product groups* submitted) 36

6. Type of Business (check (✔) all that apply)	7. Gross Annual Receipts *For Calendar Year 2003* (check (✔) one)	8. Employees *For Calendar Year 2003*		9. Contract Employees *For Calendar Year 2003*	
		Worldwide (check (✔) one)	California Only (check (✔) one)	Worldwide (check (✔) one)	California Only (check (✔) one)
☒ Manufacturer/ Marketer	☐ Less than $250,000	☐ None	☒ None	☐ None	☒ None
☒ Distributor	☐ Between $250,000 and $1 million	☐ 1 to 10	☐ 1 to 10	☐ 1 to 10	☐ 1 to 10
☒ Retailer	☐ Between $1 million and $10 million	☐ 11 to 100	☐ 11 to 100	☒ 11 to 100	☐ 11 to 100
☒ Contract Packager	☐ Between $10 million and $50 million	☒ 101 to 250	☐ 101 to 250	☐ 101 to 250	☐ 101 to 250
☐ Other (specify):	☒ Between $50 million and $100 million	☐ 251 to 500	☐ 251 to 500	☐ 251 to 500	☐ 251 to 500
	☐ Between $100 million and $1 billion	☐ 501 to 750	☐ 501 to 750	☐ 501 to 750	☐ 501 to 750
	☐ More than $1 billion	☐ More than 750	☐ More than 750	☐ More than 750	☐ More than 750

10. **Comments:**

11. **Certification:** I am an authorized representative (management level) of the *responsible party* listed above and certify that all information submitted in this survey is complete, true, and correct.
Name: Fred Macleod **Title:** VP, Marketing
Signature: Fred Macleod **Date:** 12/15/04

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Check (✓) if Confidential ☐

FORM 2 – Source of Ingredient Information

(Instructions for completing FORM 2: See back side)

Will your company be using a *formulator*? Check (✓) "no" or "yes" and complete the blanks as indicated.

☐ **No, my company, _____, the *responsible party*, will not be using a *formulator* to complete ingredient information for any product or *product group* submitted for this survey.**

– OR –

☒ **Yes, my company, Cornstarch Beauty Products, Inc, the *responsible party*, will be using a *formulator* to complete ingredient information for one or more products submitted for this survey.** *List formulator contact information below; photocopy sheet as needed.*

formulator

Product Tracking Number(s): 4 8 20

Formulator Company Name: Nail Products USA, Inc.

Address: 1371 Chester Ave.

City: Chicago **State:** IL **Zip:** 60607

Formulator Contact Name: Darren Fletcher

Title: Product Line Manager

Phone: (312) 555-9165 **Fax:** (312) 555-9164

Email: dfletcher@nailusa.com

formulator

Product Tracking Number(s): 2 7 21 22

Formulator Company Name: Beauty Chemistry

Address: 300 Franklin St. Floor 18

City: New York **State:** NY **Zip:** 10014

Formulator Contact Name: Monica Gianni

Title: Chemist

Phone: (347) 555-1279 **Fax:** (347) 555-5749

Email: monicagiannie@beautychem.com

formulator

Product Tracking Number(s):

Formulator Company Name: _____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Formulator Contact Name: _____

Title: _____

Phone: _____ **Fax:** _____

Email: _____

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CALIFORNIA AIR RESOURCES BOARD *** 2003 CONSUMER & COMMERCIAL PRODUCTS SURVEY

Check (✔) if Confidential ☑

FORM 3 – Product Information

(Instructions for completing FORM 3: See back side)

Product Tracking #: 4

1. Full Product Name: 3 in 1 Nail Miracle - Pink Group

2. Company Name: Cornstarch Beauty Products

3. ARB Category Code(s)
Primary Category Code: 30906 *If applicable*, Additional Category Code(s): 30903 30911

4. Product Groups
Does this product represent a *product group*? ☑ yes ☐ no
If yes, list individual products on "Supplement to FORM 3".
Also specify which attribute(s) were used to group the products: ☑ Color ☐ Fragrance ☑ Size ☐ Botanical/herbal extract

5. Delivery/ Packaging System check (✔) one
- ☐ wipes/towels/cloths/sheets/pads
- ☐ pressurized aerosol container
- ☐ non-pressurized pump system (i.e. spray, foam, liquid)
- ☐ barrier pack or compartmentalized dispenser
- ☑ jar/can/tub/pourable bottle
- ☐ squeeze tube or squeeze bottle
- ☐ other (specify): _____

6. Dispensed Form check (✔) one
- ☐ post-foaming gel
- ☐ foam/mousse
- ☑ liquid
- ☐ semisolid
- ☐ solid
- ☐ mist/dispersed spray
- ☐ other (specify): _____

7. Relation to Product check (✔) all that apply
- ☐ Manufacturer/ Marketer
- ☐ Distributor
- ☑ Retailer
- ☐ Contract Packager
- ☐ Other (specify): _____

8. Customer Type check (✔) all that apply
- ☑ Household 80 %
- ☑ Commercial/ Institutional 20 %
- ☐ Industrial ____ %

total must = 100%

9. Dilution Ratios
Is this product sold as a *concentrate*? ☐ yes ☑ no
If yes, complete the dilution ratio table below.
Also specify the *diluent*: _____

	Product		Diluent	
Dilution:	*amount*	*units*	*amount*	*units*
least dilute				
most dilute				

10. Sales Data Collection Method check (✔) one
- ☑ Used CA-specific sales data
- ☐ Estimated by prorating data

Specify "national", "regional", "distribution centers" or other: _____

- ☐ Other collection method used (specify): _____

11. General Information
- Is this a *pet care product*? ☐ yes ☑ no
- Is this a FIFRA registered product? ☐ yes ☑ no
- Is this product regulated by the FDA as an OTC drug? ☐ yes ☑ no
- Does this product contain a resin, polymer, or other film-forming compound? ☑ yes ☐ no

12. 2003 California Sales Data: complete for each size sold *(for wipes/towels and barrier packs see instructions)*

	Product Size (from label)	Volume/Mass filled (include *overfill* of 2% or more)	Units (wt oz or fl oz)	Qty Sold	Liquids (fl oz) only: *Density (units)*	*-OR- Specific Gravity*
#1	0.25	0.25	fl oz	30,051		0.98
#2	0.45	0.45	" "	27,482		" "
#3						
#4						
#5						
#6						

13. Comments: _____

LABELS: Submit one entire representative *label* for this product or *product group*.
Check (✔) one: ☐ Label attached or submitted electronically, **OR** ☒ Label submitted in 2001 Survey; 2001 Survey Product Tracking #: 8 *(required for this response)*

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Supplement to FORM 3 – Product Group Details

Product Tracking #: 4

The table below has been provided *only* for those companies that have grouped products together for the purposes of this survey (see FORM 3, Item 4).

1. Copy the following from FORM 3:
   - Company Name: Cornstarch Beauty Products, Inc
   - Full product name representing this *product group*: 3 in 1 Nail Miracle - Pink Group
   - Product Tracking #: *place in box, upper right corner of this page.*

2. Complete the following columns according to the method used to group the products (by color, *fragrance*, botanical/herbal extract, and/or size), which is also indicated by checking the attribute box(es) on FORM 3. Submit one completed copy of this page for each FORM 3 that represents a *product group.*

Individual Product Name	**Color** (if applicable)	**Fragrance/ Botanical or herbal extract** (if applicable)	**Size and units** (if applicable)
3 in 1 Nail Miracle	Pretty Pink		0.25 fl oz
" — "	Carnation		0.25 fl oz
" — "	Rose		" — "
" — "	Salmon		" — "
" — "	Blushing Pink		" — "
3 in 1 Nail Miracle	Pretty Pink		0.45 fl oz
" — "	Carnation		" — "
" — "	Rose		" — "
" — "	Salmon		" — "
" — "	Blushing Pink		" — "
More products to list? Photocopy this page as needed.			

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Check (✓) if Confidential ☐

FORM 4 – Ingredient Information

(Instructions for completing FORM 4: See back side)

Product Tracking #: 4

A. PRODUCT NAME & RESPONSIBLE PARTY COMPANY NAME – *To be completed by the responsible party; copy from corresponding FORM 3.*

Full Product Name: 3 in 1 Nail Miracle - Pink Group

Company Name: Cornstarch Beauty Products

B. RESPONSIBLE PARTY CONTACT INFORMATION – *Only needed when responsible party is sending this form to a formulator for completion of Part C.*

Contact Person: Fred MacLeod Phone: (641) 555-8316 Fax: (641) 555-5634

Title: VP, Marketing Email: macleodf@tbinternational.net

C. INGREDIENTS – *To be completed by the company that holds the ingredient information (either the responsible party or formulator).*

1. Specific Ingredient Table: Indicate the weight percent (Wt. %) of the following compounds that are contained in the product.

HFC-134a	1,1,1-Trichloroethane	Parachlorobenzotrifluoride	AMP	Perchloroethylene	Paradichlorobenzene	Naphthalene	Nitrogen	Menthol

HCFC-141b	Methylene Chloride	Volatile Methyl Siloxanes	HFC-152a	Acetone	Methyl Acetate	Carbon Dioxide	Water	C1 % Subtotal
								= 0.0 C1

2. Speciation Table: List all *VOCs, partial LVP-VOCs,* and *LVP-VOCs* (see Attachment E for "LVP-VOCs to be Individually Reported") that comprise at least 0.1 Wt. %. Group other *LVP-VOCs* (those not reported individually), other exempts (those not listed above), other inorganics (those not listed above), all fragrance, and all *VOCs* that *individually* comprise less than 0.1 Wt. %, as indicated in each line-item entry below.

	Chemical Name	CAS Number	Trade Name & Manufacturer*	Bin #*	Weight %
1	Ethyl Acetate	141-78-6			22.0
2	Butyl Acetate	123-86-4			30.0
3	Isopropyl Alcohol	67-63-0			12.3
4	Dibutyl Phthalate	84-66-2			5.7
5	Camphor	76-22-2			2.0
6	Benzophenone	119-61-9			1.7
7					
8					

If more lines are needed, list additional ingredients on a separate page; enter the weight percent subtotal from that page on this line: =

Group other *LVP-VOCs* (those not listed individually above): **Group Total** = 14.1

Group other exempts (those not listed in item C1): **Group Total** =

Group other inorganics (those not listed in item C1): **Group Total** = 11.0

Group all Fragrance: **Group Total** = 0.0

Group *VOCs* that are *each* less than 0.1 Wt. %: **Group Total** = 1.2

Section C2 % Subtotal = 100.0 C2

Grand Total *(Sections C1 + C2 must = 100%)* = 100.0 Total

3. *Ingredient Contact Information*

Completed By: Darren Fletcher

Title: Product Line Manager Phone (312) 555-9165 Email: dfletcher@nailusa.com

Formulating Company: Nail Products USA Date: 12/20/04

*Completion of these columns is required only if the ingredient is a *hydrocarbon solvent*, such as mineral spirits; otherwise these columns are optional. See instructions for details and Attachment F for a list of trade names and bin numbers.

Questions? Visit www.arb.ca.gov/consprod/regact/2003surv/2003surv.htm

SAMPLE #3: KITTY-B-CLEAN CAT BATHING WIPES

To provide help in understanding the following sample forms, this section provides some general information about Product Sample #3.

Background

The Company. Hearty Pet International (HPI) is independently owned and submitting only one product.

The Product. Kitty-B-Clean Cat Bathing Wipes are used to clean cats' bodies between grooming sessions.

Notable Form Details

Some items from the forms are detailed here for clarity.

FORM 1 – Responsible Party Information

- Although Jane Furley is the contact person, a management-level representative, Julio Serrano, has signed the form.

FORM 2 – Source of Ingredient Information

- "No" was checked because HPI holds the ingredient information for the one product submitted.

FORM 3 – Product Information

- The most appropriate category for this product, based on claims on the *principal display panel*, was entered for Item 3.
- Because there are two product sizes, "yes" and "size" are checked in item 4 and the "Supplement to FORM 3" is appropriately filled out.
- Because the product is a liquid-impregnated paper cloth, "wipes" was selected for Item 5, and "liquid" was selected for Item 6.
- HPI's Western Region includes Washington, Idaho, Oregon, California, Utah, and Arizona. Jane calculated the sales data (Item 10) by dividing California's population by the total population of the six states in the region, then multiplying this percentage by the number of units sold in the entire region.
- In Item 11, only the pet care question applies to the product.
- Two sizes of product are sold, as noted in Item 12. The product size on the *label* gives the number of wipes in the container. The "volume/mass filled" refers to the amount of product (liquid portion only), **not including the cloth substrate.** The number of units sold was calculated as outlined in Item 10.

FORM 4 – Ingredient Information

- Section B is not completed because HPI did not send this form to a *formulator*; HPI completed their own ingredient information.
- Kitty-B-Clean Wipes do not contain any *hydrocarbon solvents*; therefore, no trade names or *manufacturers* are listed.

Note

It is assumed that HPI sent the "Preliminary Form: Who Must Complete the Survey?" ahead of time. HPI also submitted a product *label*, Confidential Information Form, and Voluntary Survey Evaluation with these forms, however they are not included in this sample.

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STATIONARY SOURCE DIVISION, AIR QUALITY MEASURES BRANCH

Check (✔) if Confidential ☐

FORM 1 – Responsible Party Information

(Instructions for completing FORM 1: See back side)

1. **Company Name:** Hearty Pet International
   Division Name(s):
   Mailing Address: 753 W. Calaveras Dr.
   City: Payson **State:** AZ **Zip:** 85541
   Webpage: www.heartypet.com

2. **Parent Company Name** (if applicable):
   Mailing Address:
   City: **State:** **Zip:**
   Webpage:

3. **Contact Person:** Jane Furley **Phone:** (520) 555-2362 **Fax:** (520) 555-9551
   Title: EH+S Assistant **Email:** jfurley@heartypet.com

4. **NAICS Code(s):** (see Attachment C for common codes) 424990 | 453910 | | | |

5. **Number of products:** (enter total number of products and/or *product groups* submitted) 1

6. Type of Business	7. Gross Annual Receipts *For Calendar Year 2003*	8. Employees *For Calendar Year 2003*		9. Contract Employees *For Calendar Year 2003*	
check (✔) all that apply	check (✔) one	Worldwide check (✔) one	California Only check (✔) one	Worldwide check (✔) one	California Only check (✔) one
☑ Manufacturer/ Marketer	☐ Less than $250,000	☐ None	☑ None	☑ None	☑ None
☐ Distributor	☑ Between $250,000 and $1 million	☐ 1 to 10	☐ 1 to 10	☐ 1 to 10	☐ 1 to 10
☑ Retailer	☐ Between $1 million and $10 million	☑ 11 to 100	☐ 11 to 100	☐ 11 to 100	☐ 11 to 100
☐ Contract Packager	☐ Between $10 million and $50 million	☐ 101 to 250	☐ 101 to 250	☐ 101 to 250	☐ 101 to 250
☐ Other (specify):	☐ Between $50 million and $100 million	☐ 251 to 500	☐ 251 to 500	☐ 251 to 500	☐ 251 to 500
	☐ Between $100 million and $1 billion	☐ 501 to 750	☐ 501 to 750	☐ 501 to 750	☐ 501 to 750
	☐ More than $1 billion	☐ More than 750	☐ More than 750	☐ More than 750	☐ More than 750

10. **Comments:**

11. **Certification:** I am an authorized representative (management level) of the *responsible party* listed above and certify that all information submitted in this survey is complete, true, and correct.
Name: Julio Serrano **Title:** EH+S Supervisor
Signature: Julio Serrano **Date:** 12/01/04

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Check (✔) if Confidential ☐

FORM 2 – Source of Ingredient Information

(Instructions for completing FORM 2: See back side)

Will your company be using a *formulator*? Check (✔) "no" or "yes" and complete the blanks as indicated.

☒ **No, my company,** Hearty Pet International, **the *responsible party*, will not be using a *formulator* to complete ingredient information for any product or *product group* submitted for this survey.**

– OR –

☐ **Yes, my company, _____, the *responsible party*, will be using a *formulator* to complete ingredient information for one or more products submitted for this survey.** *List formulator contact information below; photocopy sheet as needed.*

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____ **Formulator Contact Name:** _____

Title: _____

Address: _____ **Phone:** _____ **Fax:** _____

City: _____ **State:** _____ **Zip:** _____ **Email:** _____

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____ **Formulator Contact Name:** _____

Title: _____

Address: _____ **Phone:** _____ **Fax:** _____

City: _____ **State:** _____ **Zip:** _____ **Email:** _____

formulator

Product Tracking Number(s): ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Formulator Company Name: _____ **Formulator Contact Name:** _____

Title: _____

Address: _____ **Phone:** _____ **Fax:** _____

City: _____ **State:** _____ **Zip:** _____ **Email:** _____

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Check (✔) if Confidential ☐

FORM 3 – Product Information

(Instructions for completing FORM 3: See back side)

Product Tracking #: 1

1. Full Product Name: Kitty-B-Clean Cat Bathing Wipes

2. Company Name: Hearty Pet Int'l

3. ARB Category Code(s)
Primary Category Code: 30208
If applicable, Additional Category Code(s):

4. Product Groups
Does this product represent a *product group*? ☑ yes ☐ no
If yes, list individual products on "Supplement to FORM 3".
Also specify which attribute(s) were used to group the products: ☐ Color ☐ Fragrance ☑ Size ☐ Botanical/herbal extract

5. Delivery/ Packaging System check (✔) one
- ☑ wipes/towels/cloths/sheets/pads
- ☐ pressurized aerosol container
- ☐ non-pressurized pump system (i.e. spray, foam, liquid)
- ☐ barrier pack or compartmentalized dispenser
- ☐ jar/can/tub/pourable bottle
- ☐ squeeze tube or squeeze bottle
- ☐ other (specify):

6. Dispensed Form check (✔) one
- ☐ post-foaming gel
- ☐ foam/mousse
- ☑ liquid
- ☐ semisolid
- ☐ solid
- ☐ mist/dispersed spray
- ☐ other (specify):

7. Relation to Product check (✔) all that apply
- ☑ Manufacturer/ Marketer
- ☐ Distributor
- ☑ Retailer
- ☐ Contract Packager
- ☐ Other (specify):

8. Customer Type check (✔) all that apply
- ☑ Household 100 %
- ☐ Commercial/ Institutional ____ %
- ☐ Industrial ____ %

total must = 100%

9. Dilution Ratios
Is this product sold as a *concentrate*? ☐ yes ☑ no
If yes, complete the dilution ratio table below.
Also specify the *diluent*:

	Product		Diluent	
Dilution:	*amount*	*units*	*amount*	*units*
least dilute				
most dilute				

10. Sales Data Collection Method check (✔) one
- ☐ Used CA-specific sales data
- ☑ Estimated by prorating data

Specify "national", "regional", "distribution centers" or other: regional
- ☐ Other collection method used (specify):

11. General Information
- Is this a *pet care product*? ☑ yes ☐ no
- Is this a FIFRA registered product? ☐ yes ☑ no
- Is this product regulated by the FDA as an OTC drug? ☐ yes ☑ no
- Does this product contain a resin, polymer, or other film-forming compound? ☐ yes ☑ no

12. 2003 California Sales Data: complete for each size sold *(for wipes/towels and barrier packs see instructions)*

	Product Size (from label)	Volume/Mass filled (include *overfill* of 2% or more)	Units (wt oz or fl oz)	Qty Sold	Liquids (fl oz) only: Density (units)	-OR- Specific Gravity
#1	10	1.44	wt oz	7,346		
#2	50	7.19	" "	16,203		
#3						
#4						
#5						
#6						

13. Comments:

LABELS: Submit one entire representative *label* for this product or *product group*.
Check (✔) one: ☑ Label attached or submitted electronically, **OR** ☐ Label submitted in 2001 Survey; 2001 Survey Product Tracking #:_____ *(required for this response)*

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Product Tracking #: 1

Supplement to FORM 3 – Product Group Details

The table below has been provided *only* for those companies that have grouped products together for the purposes of this survey (see FORM 3, Item 4).

1. Copy the following from FORM 3:
   - Company Name: Hearty Pet International
   - Full product name representing this *product group*: Kitty-B-Clean Cat Bathing Wipes
   - Product Tracking #: *place in box, upper right corner of this page.*

2. Complete the following columns according to the method used to group the products (by color, *fragrance*, botanical/herbal extract, and/or size), which is also indicated by checking the attribute box(es) on FORM 3. Submit one completed copy of this page for each FORM 3 that represents a *product group*.

Individual Product Name	**Color** (if applicable)	**Fragrance/ Botanical or herbal extract** (if applicable)	**Size and units** (if applicable)
Kitty-B-Clean Cat Bathing Wipes			10 wipes
Kitty-B-Clean Cat Bathing Wipes			50 wipes
More products to list? Photocopy this page as needed.			

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CALIFORNIA AIR RESOURCES BOARD *** 2003 CONSUMER & COMMERCIAL PRODUCTS SURVEY

Check (✔) if Confidential ☐

FORM 4 – Ingredient Information

(Instructions for completing FORM 4: See back side)

Product Tracking #: 1

A. PRODUCT NAME & RESPONSIBLE PARTY COMPANY NAME – *To be completed by the responsible party; copy from corresponding FORM 3.*

Full Product Name: Kitty-B-Clean Bathing Wipes | Company Name: Hearty Pet Int'l

B. RESPONSIBLE PARTY CONTACT INFORMATION – *Only needed when responsible party is sending this form to a formulator for completion of Part C.*

Contact Person: _____ Phone: _____ Fax: _____

Title: _____ Email: _____

C. INGREDIENTS – *To be completed by the company that holds the ingredient information (either the responsible party or formulator).*

1. **Specific Ingredient Table:** Indicate the weight percent (Wt. %) of the following compounds that are contained in the product.

HFC-134a	1,1,1-Trichloroethane	Parachlorobenzotrifluoride	AMP	Perchloroethylene	Paradichlorobenzene	Naphthalene	Nitrogen	Menthol

HCFC-141b	Methylene Chloride	Volatile Methyl Siloxanes	HFC-152a	Acetone	Methyl Acetate	Carbon Dioxide	Water	C1 % Subtotal
							93.0 =	93.0 C1

2. **Speciation Table:** List all *VOCs, partial LVP-VOCs* and *LVP-VOCs* (see Attachment E for "LVP-VOCs to be Individually Reported") that comprise at least 0.1 Wt. %. Group other *LVP-VOCs* (those not listed individually), other exempts (those not listed above), other inorganics (those not listed above), all fragrance, and all *VOCs* that *individually* comprise less than 0.1 Wt. % as indicated in each line-item entry below.

	Chemical Name	CAS Number	Trade Name & Manufacturer*	Bin #*	Weight %
1	propylene glycol	57-55-6			4.5
2					
3					
4					
5					
6					
7					
8					

If more lines are needed, list additional ingredients on a separate page; enter the weight percent subtotal from that page on this line: =

Group other *LVP-VOCs* (those not listed individually above): **Group Total** = 0.5

Group other exempts (those not listed in item C1): **Group Total** =

Group other inorganics (those not listed in item C1): **Group Total** = 1.0

Group all Fragrance: **Group Total** = 1.0

Group *VOCs* that are *each* less than 0.1 Wt. %: **Group Total** =

Section C2 % Subtotal = 7.0 C2

Grand Total *(Sections C1 + C2 must = 100%)* = 100.0 Total

3. ***Ingredient Contact Information***

Completed By: Jane Furley

Title: EH+S Assistant **Phone:** (530)555-2362 **Email:** jfurley@heartypet.com

Formulating Company: Hearty Pet Int'l **Date:** 11/30/04

*Completion of these columns is required only if the ingredient is a *hydrocarbon solvent*, such as mineral spirits; otherwise these columns are optional. See instructions for details and Attachment F for a list of trade names and bin numbers.

Questions? Visit www.arb.ca.gov/consprod/regact/2003surv/2003surv.htm

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PART VII:
Definitions

DEFINITIONS FOR BOLDED CATEGORIES

The terms in this section are ARB-defined categories. These definitions should not be used as a basis for a decision to report or not report. Strikeout/underline formatting reflects changes from the 2004 Consumer and Commercial Products Regulation Amendments that have not yet been approved by the California Office of Administrative Law (OAL).

"Adhesive" means any product that is used to bond one surface to another by attachment. "Adhesive" does not include products used on humans and animals, adhesive tape, contact paper, wallpaper, shelf liners, or any other product with an adhesive incorporated onto or in an inert substrate. For "Contact Adhesive," "Construction, Panel, and Floor Covering Adhesive," and "General Purpose Adhesive" only, "adhesive" also does not include units of product, less packaging, which weigh more than one pound and consist of more than 16 fluid ounces. This limitation does not apply to aerosol adhesives.

"Adhesive Remover" means a product designed ~~exclusively for the removal of~~ to remove adhesive~~s, caulk and other bonding materials~~ from either a specific substrate or a variety of substrates. "Adhesive Removers" do not include products that remove adhesives intended for use on humans or animals.

For the purpose of this definition and "Adhesive Remover" subcategories (A-D), the term "adhesive" shall mean a substance used to bond one or more materials. Adhesive includes, but is not limited to: caulks; sealants; glues; or similar substances used for the purpose of forming a bond.

(A) "Floor or Wall Covering Adhesive Remover" means a product designed or labeled to remove floor or wall coverings and associated adhesive from the underlying substrate.

(B) "Gasket or Thread Locking Adhesive Remover" means a product designed or labeled to remove gaskets or thread locking adhesives. Products labeled for dual use as a paint stripper and gasket remover and/or thread locking adhesive remover are considered "Gasket or Thread Locking Adhesive Remover."

(C) "General Purpose Adhesive Remover" means a product designed or labeled to remove cyanoacrylate adhesives as well as non-reactive adhesives or residue from a variety of substrates. "General Purpose Adhesive Remover" includes, but is not limited to, products that remove thermoplastic adhesives; pressure sensitive adhesives; dextrine or starch-based adhesives; casein glues; rubber or latex-based adhesives; as well as products that remove stickers; decals; stencils; or similar materials. "General Purpose Adhesive Remover" does not include "Floor or Wall Covering Adhesive Remover."

(D) "Specialty Adhesive Remover" means a product designed to remove reactive adhesives from a variety of substrates. Reactive adhesives include adhesives that require a hardener or catalyst in order for the bond to occur. Examples of reactive adhesives include, but are not limited to: epoxies; urethanes; silicones. "Specialty Adhesive Remover" does not include "Gasket or Thread Locking Adhesive Remover."

"Aerosol Adhesive" means any adhesive packaged as an aerosol product in which the spray mechanism is permanently housed in a nonrefillable can designed for hand-held application without the need for ancillary hoses or spray equipment. Aerosol adhesives include special purpose spray adhesives, mist spray adhesives, and web spray adhesives.

"Aerosol Cooking Spray" means any aerosol product designed either to reduce sticking on cooking and baking surfaces or to be applied on food, or both.

"Air Freshener" means any consumer product including, but not limited to, sprays, wicks, powders, and crystals, designed primarily for the purpose of masking odors, or freshening, cleaning, scenting, or deodorizing the air. "Air Freshener" includes dual purpose air freshener/disinfectant products. "Air Freshener" does not include products that are used on the human body, ~~or~~ products that function primarily as cleaning products as indicated on a product label, ~~or advertisement.~~ or "Toilet/Urinal Care Product."

"Antimicrobial Hand or Body Cleaner or Soap" means a cleaner or soap which is designed to reduce the level of microorganisms on the skin through germicidal activity, and is regulated as an over-the-counter drug by the U.S. Food and Drug Administration. "Antimicrobial Hand or Body Cleaner or Soap" includes, but is not limited to, (A) antimicrobial hand or body washes/cleaners, (B) foodhandler hand washes, (C) healthcare personnel hand washes, (D) pre-operative skin preparations and (E) surgical scrubs. "Antimicrobial Hand or Body Cleaner or Soap" does not include prescription drug products, antiperspirants, "Astringent/Toner," deodorant, "Facial Cleaner or Soap," "General-use Hand or Body Cleaner or Soap," "Hand Dishwashing Detergent" (including antimicrobial), "Heavy-duty Hand Cleaner or Soap," "Medicated Astringent/Medicated Toner," and "Rubbing Alcohol."

"Antiperspirant" means any product including, but not limited to, aerosols, roll-ons, sticks, pumps, pads, creams, and squeeze-bottles, that is intended by the manufacturer to be used to reduce perspiration in the human axilla by at least 20 percent in at least 50 percent of a target population.

"Anti-Static Product" means a product that is labeled to eliminate, prevent, or inhibit the accumulation of static electricity. "Anti-Static Product" does not include "Electronic Cleaner," "Floor Polish or Wax," "Floor Coating," and products that meet the definition of "Aerosol Coating Product" or "Architectural Coating".

"Astringent/Toner" means any product not regulated as a drug by the United States Food and Drug Administration (FDA) which is applied to the skin for the purpose of cleaning or tightening pores. This category also includes clarifiers and substrate-impregnated products. This category does not include any hand, face, or body cleaner or soap product, "Medicated Astringent/Medicated Toner", "Personal Fragrance Product", cold cream, lotion, or antiperspirant.

"Automotive Brake Cleaner" means a cleaning product designed to remove oil, grease, brake fluid, brake pad material or dirt from motor vehicle brake mechanisms.

"Automotive Hard Paste Wax" means an automotive wax or polish which is:
(A) designed to protect and improve the appearance of automotive paint surfaces; and (B) a solid at room temperature; and (C) contains 0% water by formulation.

"Automotive Instant Detailer" means a product designed for use in a pump spray that is applied to the painted surface of automobiles and wiped off prior to the product being allowed to dry.

"Automotive Rubbing or Polishing Compound" means a product designed primarily to remove oxidation, old paint, scratches or "swirl marks", and other defects from the painted surfaces of motor vehicles without leaving a protective barrier.

"Automotive Wax, Polish, Sealant or Glaze" means a product designed to seal out moisture, increase gloss, or otherwise enhance a motor vehicle's painted surfaces. "Automotive Wax, Polish, Sealant or Glaze" includes, but is not limited to, products designed for use in autobody repair shops and "drive-through" car washes, as well as products designed for the general public. "Automotive Wax, Polish, Sealant or Glaze" does not include "Automotive Rubbing or Polishing Compounds", automotive wash and wax products, surfactant-containing car wash products, and products designed for use on unpainted surfaces such as bare metal, chrome, glass, or plastic.

"Automotive Windshield Washer Fluid (Dilutable)" means any liquid which meets the following criteria:

(A) the product is sold either in a container with a capacity of 55 gallons or more, or a container with a capacity of one quart or less; and
(B) the product is designed for use in a motor vehicle windshield washer fluid system either as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield(s).

"Automotive Windshield Washer Fluid (Dilutable)" does not include any fluid which is placed in a new motor vehicle at the time the vehicle is manufactured.

"Automotive Windshield Washer Fluid (Pre-Mixed)" means any liquid which meets the following criteria:

(A) the product is sold in a container with a capacity that is greater than one quart, but less than 55 gallons; and

(B) the product is designed for use in a motor vehicle windshield washer fluid system as an anti-freeze or for the purpose of cleaning, washing, bug removal, or wetting the windshield(s).

"Automotive Windshield Washer Fluid (Pre-Mixed)" does not include any fluid which is placed in a new motor vehicle at the time the vehicle is manufactured.

"Bathroom and Tile Cleaner" means a product designed to clean tile or surfaces in bathrooms. "Bathroom and Tile Cleaner" does not include products ~~specifically~~ designed primarily to clean toilet bowls, ~~or~~ toilet tanks, or urinals.

"Bug and Tar Remover" means a product ~~designed~~ labeled to remove either or both of the following from painted motor vehicle surfaces without causing damage to the finish: (A) biological-type residues such as insect carcasses and tree sap and, (B) road grime, such as road tar, roadway paint markings, and asphalt.

"Carburetor or Fuel-Injection Air Intake Cleaners" means a product designed to remove fuel deposits, dirt, or other contaminants from a carburetor, choke, throttle body of a fuel-injection system, or associated linkages. "Carburetor or fuel-injection air intake cleaners" does not include products designed exclusively to be introduced directly into the fuel lines or fuel storage tank prior to introduction into the carburetor or fuel injectors.

"Carpet and Upholstery Cleaner" means a cleaning product designed for the purpose of eliminating dirt and stains on rugs, carpeting, and the interior of motor vehicles and/or on household furniture or objects upholstered or covered with fabrics such as wool, cotton, nylon or other synthetic fabrics. "Carpet and Upholstery Cleaner" includes, but is not limited to, products that make fabric protectant claims. "Carpet and Upholstery Cleaner" does not include "General Purpose Cleaners", "Spot Removers", vinyl or leather cleaners, dry cleaning fluids, or products designed exclusively for use at industrial facilities engaged in furniture or carpet manufacturing.

"Charcoal Lighter Material" means any combustible material designed to be applied on, incorporated in, added to, or used with charcoal to enhance ignition. "Charcoal Lighter Material" does not include any of the following: (A) electrical starters and probes, (B) metallic cylinders using paper tinder, (C) natural gas, (D) propane, and (E) fat wood.

"Construction, Panel, and Floor Covering Adhesive" means any one-component adhesive that is designed exclusively for the installation, remodeling, maintenance, or repair of: (A) structural and building components that include, but are not limited to, beams, trusses, studs, paneling (drywall or drywall laminates, fiberglass reinforced plastic (FRP), plywood, particle board, insulation board, pre-decorated hardboard or tileboard, etc.), ceiling and acoustical tile, molding, fixtures, countertops or countertop laminates, cove or wall bases, and flooring or subflooring; or (B) floor or wall coverings that include, but are not limited to, wood or simulated wood covering, carpet, carpet pad or cushion, vinyl-backed carpet, flexible flooring material,

nonresilient flooring material, mirror tiles and other types of tiles, and artificial grass. "Construction, Panel, and Floor Covering Adhesive" does not include "Floor Seam Sealer". "Contact Adhesive" means an adhesive that: (A) is designed for application to both surfaces to be bonded together, and (B) is allowed to dry before the two surfaces are placed in contact with each other, and (C) forms an immediate bond that is impossible, or difficult, to reposition after both adhesive-coated surfaces are placed in contact with each other, and (D) does not need sustained pressure or clamping of surfaces after the adhesive-coated surfaces have been brought together using sufficient momentary pressure to establish full contact between both surfaces. "Contact Adhesive" does not include rubber cements that are primarily intended for use on paper substrates. "Contact Adhesive" also does not include vulcanizing fluids that are designed and labeled for tire repair only.

"Contact Adhesive - General Purpose" means any contact adhesive that is not a "Contact Adhesive - Special Purpose".

"Contact Adhesive - Special Purpose" means a contact adhesive that: (A) is used to bond melamine-covered board, unprimed metal, unsupported vinyl, Teflon, ultra-high molecular weight polyethylene, rubber, high pressure laminate or wood veneer 1/16 inch or less in thickness to any porous or nonporous surface, and is sold in units of product, less packaging, that contain more than eight fluid ounces, or (B) is used in automotive applications that are (1.) automotive under-the-hood applications requiring heat, oil or gasoline resistance, or (2.) body-side molding, automotive weatherstrip or decorative trim.

"Crawling Bug Insecticide" means any insecticide product that is designed for use against ants, cockroaches, or other household crawling arthropods, including, but not limited to, mites, silverfish or spiders. "Crawling Bug Insecticide" does not include products designed to be used exclusively on humans or animals, or any house dust mite product. For the purposes of this definition only:

> "House dust mite product" means a product whose label, packaging, or accompanying literature states that the product is suitable for use against house dust mites, but does not indicate that the product is suitable for use against ants, cockroaches, or other household crawling arthropods.
>
> "House dust mite" means mites which feed primarily on skin cells shed in the home by humans and pets and which belong to the phylum Arthropoda, the subphylum Chelicerata, the class Arachnida, the subclass Acari, the order Astigmata, and the family Pyroglyphidae.

"Deodorant" means any product including, but not limited to, aerosols, roll-ons, sticks, pumps, pads, creams, and squeeze-bottles, that is intended by the manufacturer to be used to minimize odor in the human axilla by retarding the growth of bacteria which cause the decomposition of perspiration.

"Deodorant Body Spray" means:

(A) for products manufactured before January 1, 2006: a "Personal Fragrance Product" with 20 percent or less fragrance.

(B) for products manufactured on or after January 1, 2006: a "Personal Fragrance Product" with 20 percent or less fragrance, that is designed for application all over the human body to provide a scent. A "Deodorant Body Spray" product that indicates or depicts on the container or packaging, or on any sticker or label affixed thereto, that it can be used on or applied to the human axilla, is a "Deodorant" as defined in section 94501(d).

"Disinfectant" means any product intended to destroy or irreversibly inactivate infectious or other undesirable bacteria, pathogenic fungi, or viruses on surfaces or inanimate objects and whose label is registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 136, et seq.). "Disinfectant" does not include any of the following: (A) products designed solely for use on human or animals, (B) products designed for agricultural use, (C) products designed solely for use in swimming pools, therapeutic tubs, or hot tubs, (D) products which, as indicated on the principal display panel or label, are designed primarily for use as bathroom and tile cleaners, glass cleaners, general purpose cleaners, toilet bowl cleaners, or metal polishes.

"Double Phase Aerosol Air Freshener" means an aerosol air freshener with the liquid contents in two or more distinct phases that requires the product container be shaken before use to mix the phases, producing an emulsion.

"Dual Purpose Air Freshener/Disinfectant" means an aerosol product that is represented on the product container for use as both a disinfectant and an air freshener, or is so represented on any sticker, label, packaging, or literature attached to the product container.

"Dusting Aid" means a product designed to assist in removing dust and other soils from floors and other surfaces without leaving a wax or silicone based coating. "Dusting Aid" does not include "Pressurized Gas Duster." ~~products which consist entirely of compressed gases for use in electronic or other specialty areas.~~

"Electrical Cleaner" means a product labeled to remove heavy soils such as grease, grime, or oil from electrical equipment, including, but not limited to, electric motors, armatures, relays, electric panels, or generators. Electrical Cleaner does not include "General Purpose Cleaner," "General Purpose Degreaser," "Dusting Aid," "Electronic Cleaner," "Energized Electrical Cleaner," "Pressurized Gas Duster," "Engine Degreaser," "Anti-Static Product," "or products designed to clean the casings or housings of electrical equipment.

"Electronic Cleaner" means a product ~~designed~~ labeled ~~specifically~~ for the removal of dirt, ~~grease, or grime~~ moisture, dust, flux, or oxides from ~~electrical~~ the internal components of electronic or precision equipment such as ~~electric motors,~~ circuit boards, ~~electricity panels, and generators~~ and the internal components of electronic devices, including but not limited to, radios, compact disc (CD) players, digital video disc (DVD) players, and computers. Electronic Cleaner does not include "General Purpose Cleaner," "General Purpose Degreaser," "Dusting Aid," "Pressurized Gas Duster," "Engine Degreaser," "Electrical Cleaner," "Energized Electrical Cleaner," "Anti-Static Product," or products designed to clean the casings or housings of electronic equipment.

"Energized Electrical Cleaner" means a product that meets both of the following criteria:

1) the product is labeled to clean and/or degrease electrical equipment, where cleaning and/or degreasing is accomplished when electrical current exists, or when there is a residual electrical potential from a component, such as a capacitor;
2) the product label clearly displays the statements: "Energized Equipment use only. Not to be used for motorized vehicle maintenance, or their parts."

"Energized Electrical Cleaner" does not include "Electronic Cleaner."

"Engine Degreaser" means a cleaning product designed to remove grease, grime, oil and other contaminants from the external surfaces of engines and other mechanical parts.

"Fabric Protectant" means a product designed to be applied to fabric substrates to protect the surface from soiling from dirt and other impurities or to reduce absorption of liquid into the fabric's fibers. "Fabric Protectant" does not include waterproofers, products designed for use solely on leather, or products designed for use solely on fabrics which are labeled "for dry clean only" and sold in containers of 10 fluid ounces or less.

"Fabric Refresher" means a product labeled to neutralize or eliminate odors on fabric including, but not limited to, soft household surfaces, rugs, carpeting, draperies, bedding, automotive interiors, footwear, athletic equipment, clothing and/or on household furniture or objects upholstered or covered with fabrics such as wool, cotton, nylon, or other synthetic fabrics. "Fabric Refresher" does not include "Anti-static Product," "Carpet and Upholstery Cleaner," "Footwear or Leather Care Product," "Spot Remover," or "Disinfectant," ~~or~~ products labeled for application to both fabric and human skin, or laundry detergents and fabric softeners that make claims to refresh fabrics, add scent, or soften fabrics.

"Facial Cleaner or Soap" means a cleaner or soap designed primarily to clean the face. "Facial Cleaner or Soap" includes, but is not limited to, facial cleansing creams, ~~gels~~ semisolids, liquids, lotions, and substrate-impregnated forms. "Facial Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap," "Astringent/Toner," "General-use Hand or Body Cleaner or Soap," "Medicated Astringent/Medicated Toner," or "Rubbing Alcohol."

"Flea and Tick Insecticide" means any insecticide product that is designed for use against fleas, ticks, their larvae, or their eggs. "Flea and Tick Insecticide" does not include products that are designed to be used exclusively on humans or animals and their bedding.

"Flexible Flooring Material" means asphalt, cork, linoleum, no-wax, rubber, seamless vinyl and vinyl composite flooring.

"Floor Polish or Wax" means a wax, polish, or any other product designed to polish, protect, or enhance floor surfaces by leaving a protective coating that is designed to be periodically replenished. "Floor Polish or Wax" does not include "spray buff products", products designed solely for the purpose of cleaning floors, floor finish strippers, products designed for unfinished wood floors, and coatings subject to architectural coatings regulations.

"Floor Seam Sealer" means any product designed and labeled exclusively for bonding, fusing, or sealing (coating) seams between adjoining rolls of installed flexible sheet flooring.

"Floor Wax Stripper" means a product designed to remove natural or synthetic floor polishes or waxes through breakdown of the polish or wax polymers, or by dissolving or emulsifying the polish or wax. "Floor Wax Stripper" does not include aerosol floor wax strippers or products designed to remove floor wax solely through abrasion.

"Flying Bug Insecticide" means any insecticide product that is designed for use against flying insects or other flying arthropods, including but not limited to flies, mosquitoes, moths, or gnats. "Flying Bug Insecticide" does not include "wasp and hornet insecticide", products that are designed to be used exclusively on humans or animals, or any moth-proofing product. For the purposes of this definition only, "moth-proofing product" means a product whose label, packaging, or accompanying literature indicates that the product is designed to protect fabrics from damage by moths, but does not indicate that the product is suitable for use against flying insects or other flying arthropods.

"Footwear or Leather Care Product" means any product designed or labeled to be applied to footwear or to other leather articles/components, to maintain, enhance, clean, protect, or modify the appearance, durability, fit, or flexibility of the footwear or leather article/component. Footwear includes both leather and non-leather foot apparel. "Footwear or Leather Care Product" does not include "Fabric Protectant," "General Purpose Adhesive," "Contact Adhesive," "Vinyl/Fabric/Leather/Polycarbonate Coating," as defined in section 94521(a), "Rubber and Vinyl Protectant," "Fabric Refresher," products solely for deodorizing, or sealant products with adhesive properties used to create external protective layers greater than 2 millimeters thick.

"Furniture Maintenance Product" means a wax, polish, conditioner, or any other product designed for the purpose of polishing, protecting or enhancing finished wood surfaces other than floors. "Furniture Maintenance Product" does not include "Dusting Aids," "Wood Cleaners," and products designed solely for the purpose of cleaning, and products designed to leave a permanent finish such as stains, sanding sealers and lacquers.

"General Purpose Adhesive" means any non-aerosol adhesive designed for use on a variety of substrates. "General Purpose Adhesive" does not include (A) contact adhesives, (B) construction, panel, and floor covering adhesives, (C) adhesives designed exclusively for application on one specific category of substrates (i.e., substrates that are composed of similar materials, such as different types of metals, paper products, ceramics, plastics, rubbers, or vinyls), or (D) adhesives designed exclusively for use on one specific category of articles (i.e., articles that may be composed of different materials but perform a specific function, such as gaskets, automotive trim, weather-stripping, or carpets).

"General Purpose Cleaner" means a product designed for general all-purpose cleaning, in contrast to cleaning products designed to clean specific substrates in certain situations. "General Purpose Cleaner" includes products designed for general floor cleaning, kitchen or countertop cleaning, and cleaners designed to be used on a variety of hard surfaces.

"General Purpose Degreaser" means any product ~~designed~~ labeled to remove or dissolve grease, grime, oil and other oil-based contaminants from a variety of substrates, including automotive or miscellaneous metallic parts. "General Purpose Degreaser" does not include "Engine Degreaser," "General Purpose Cleaner", "Adhesive Remover", "Electronic Cleaner", "Electrical Cleaner," "Energized Electrical Cleaner," "Metal Polish/Cleanser", products used exclusively in "solvent cleaning tanks or related equipment," or products that are (A) sold exclusively to establishments which manufacture or construct goods or commodities; and (B) labeled "not for retail sale". "Solvent cleaning tanks or related equipment" includes, but is not limited to, cold cleaners, vapor degreasers, conveyorized degreasers, film cleaning machines, or products designed to clean miscellaneous metallic parts by immersion in a container.

"General-use Hand or Body Cleaner or Soap" means a cleaner or soap designed to be used routinely on the skin to clean or remove typical or common dirt and soils. "General-use Hand or Body Cleaner or Soap" includes, but is not limited to, hand or body washes, dual-purpose shampoo-body cleaners, shower or bath gels, and moisturizing cleaners or soaps. "General-use Hand or Body Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap", "Astringent/Toner", "Facial Cleaner or Soap", "Hand Dishwashing Detergent" (including antimicrobial), "Heavy-duty Hand Cleaner or Soap", "Medicated Astringent/Medicated Toner", or "Rubbing Alcohol."

"Glass Cleaner" means a cleaning product designed primarily for cleaning surfaces made of glass. Glass cleaner does not include products designed solely for the purpose of cleaning optical materials used in eyeglasses, photographic equipment, scientific equipment and photocopying machines.

"Graffiti Remover" means a product labeled to remove spray paint, ink, marker, crayon, lipstick, nail polish, or shoe polish, from a variety of non-cloth or non-fabric substrates. "Graffiti Remover" does not include "Paint Remover or Stripper," "Nail Polish Remover," or "Spot Remover." Products labeled for dual use as both a paint stripper and graffiti remover are considered "Graffiti Removers."

"Hair Mousse" means a hairstyling foam designed to facilitate styling of a coiffure and provide limited holding power.

"Hair Shine" means any product designed for the primary purpose of creating a shine when applied to the hair. "Hair Shine" includes, but is not limited to, dual-use products designed primarily to impart a sheen to the hair. "Hair Shine" does not include "Hair Spray~~Hairspray~~", "Hair Mousse", "Hair Styling Product," "Hair Styling Gel" ~~or spray gel~~, ~~"Hair Styling Product",~~ or products whose primary purpose is to condition or hold the hair.

"Hair Styling Gel" means a consumer product manufactured before December 31, 2006, that is a high viscosity, often gelatinous, product that contains a resin and is designed for the application to hair to aid in styling and sculpting of the hair coiffure.

"~~Hairspray~~ Hair Spray" means:

(A) for products manufactured before December 31, 2006: a consumer product designed primarily for the purpose of dispensing droplets of a resin on and into a hair coiffure which will impart sufficient rigidity to the coiffure to establish or retain the style for a period of time, and

(B) for products manufactured on or after December 31, 2006: a consumer product that is applied to styled hair, and is designed or labeled to provide sufficient rigidity, to hold, retain and/or (finish) the style of the hair for a period of time. "Hair Spray" includes aerosol hair sprays, pump hair sprays, spray waxes; color, glitter, or sparkle hairsprays that make finishing claims; and products that are both a styling and finishing product. "Hair Spray" does not include spray products that are intended to aid in styling but does not provide finishing of a hairstyle.

For the purposes of this subchapter, "finish" or "finishing" means the maintaining and/or holding of previously styled hair for a period of time.

For the purposes of this subchapter, "styling" means the forming, sculpting, or manipulating the hair to temporarily alter the hair's shape.

"Hair Styling Product" means a consumer product manufactured on or after December 31, 2006, that is designed or labeled for the application to wet, damp or dry hair to aid in defining, shaping, lifting, styling and/or sculpting of the hair. "Hair Styling Product" includes, but is not limited to hair balm, clay, cream, creme, curl straightener, gel, liquid, lotion, paste, pomade, putty, root lifter, serum, spray gel, stick, temporary hair straightener, wax, spray products that aid in styling but do not provide finishing of a hairstyle, and leave-in volumizers, detanglers and/or conditioners that make styling claims. "Hair Styling Product" does not include "Hair Mousse", "Hair Shine", "Hair Spray", or shampoos and/or conditioners that are rinsed from the hair prior to styling.

For the purposes of this subchapter, "finish" or "finishing" means the maintaining and/or holding of previously styled hair for a period of time.

For the purposes of this subchapter, "styling" means the forming, sculpting, or manipulating the hair to temporarily alter the hair's shape.

"Heavy-Duty Hand Cleaner or Soap" means a product designed to clean or remove difficult dirt and soils such as oil, grease, grime, tar, shellac, putty, printer's ink, paint, graphite, cement, carbon, asphalt, or adhesives from the hand with or without the use of water. "Heavy-duty Hand Cleaner or Soap" does not include prescription drug products, "Antimicrobial Hand or Body Cleaner or Soap", "Astringent/Toner", "Facial Cleaner or Soap", "General-use Hand or Body Cleaner or Soap", "Medicated Astringent/Medicated Toner" or "Rubbing Alcohol."

"Insect Repellent" means a pesticide product that is designed to be applied on human skin, hair or attire worn on humans in order to prevent contact with or repel biting insects or arthropods.

"Insecticide" means a pesticide product that is designed for use against insects or other arthropods, but excluding products that are: (A) for agricultural use, or (B) for a use which requires a structural pest control license under Chapter 14 (commencing with Section 8500) of the Business and Professions Code, or (C) restricted materials that require a permit for use and possession.

"Insecticide Fogger" means any insecticide product designed to release all or most of its content, as a fog or mist, into indoor areas during a single application.

"Laundry Prewash" means a product that is designed for application to a fabric prior to laundering and that supplements and contributes to the effectiveness of laundry detergents and/or provides specialized performance.

"Laundry Starch Product" means a product that is designed for application to a fabric, either during or after laundering, to impart and prolong a crisp, fresh look and may also act to help ease ironing of the fabric. "Laundry Starch Product" includes, but is not limited to, fabric finish, sizing, and starch.

"Lawn and Garden Insecticide" means an insecticide product designed primarily to be used in household lawn and garden areas to protect plants from insects or other arthropods.

"Lubricant" means a product designed to reduce friction, heat, noise, or wear between moving parts, or to loosen rusted or immovable parts or mechanisms. "Lubricant" does not include automotive power steering fluids; products for use inside power generating motors, engines, and turbines, and their associated power-transfer gearboxes; two cycle oils or other products designed to be added to fuels; products for use on the human body or animals or products that are (1) sold exclusively to establishments which manufacture or construct goods or commodities, and (2) labeled "not for retail sale".

"Medicated Astringent/Medicated Toner" means any product regulated as a drug by the Food and Drug Administration (FDA) which is applied to the skin for the purpose of cleaning or tightening pores. "Medicated Astringent/Medicated Toner" includes, but is not limited to, clarifiers and substrate-impregnated products. "Medicated Astringent/Medicated Toner" does not include hand, face, or body cleaner or soap products, "Personal Fragrance Products", "Astringent/Toner," cold cream, lotion, antiperspirants, or products that must be purchased with a doctor's prescription.

"Metal Polish/Cleanser" means any product designed primarily to improve the appearance of finished metal, metallic, or metallized surfaces by physical or chemical action. To "improve the appearance" means to remove or reduce stains, impurities, or oxidation from surfaces or to make surfaces smooth and shiny. "Metal Polish/Cleanser" includes, but is not limited to, metal polishes used on brass, silver, chrome, copper, stainless steel and other ornamental metals. "Metal Polish/Cleanser" does not include "Automotive Wax, Polish, Sealant or Glaze", wheel cleaner, "Paint Remover or Stripper", products designed and labeled exclusively for automotive and marine detailing, or products designed for use in degreasing tanks.

"Mist spray adhesive" means any aerosol adhesive which is not a special purpose spray adhesive and which delivers a particle or mist spray, resulting in the formation of fine, discrete particles that yield a generally uniform and smooth application of adhesive to the substrate.

"Multi-purpose Dry Lubricant" means any lubricant which is: (A) designed and labeled to provide lubricity by depositing a thin film of graphite, molybdenum disulfide ("moly"), or polytetrafluoroethylene or closely related fluoropolymer ("teflon") on surfaces, and (B) designed for general purpose lubrication, or for use in a wide variety of applications.

"Multi-purpose Lubricant" means any lubricant designed for general purpose lubrication, or for use in a wide variety of applications. "Multi-purpose Lubricant" does not include "Multi-purpose Dry Lubricants", "Penetrants", or "Silicone-based Multi-purpose Lubricants".

"Multi-purpose Solvent" means any organic liquid designed to be used for a variety of purposes, including cleaning or degreasing of a variety of substrates, or thinning, dispersing or dissolving other organic materials. "Multi-purpose Solvent" includes solvents used in institutional facilities, except for laboratory reagents used in analytical, educational, research, scientific or other laboratories. "Multi-purpose Solvent" does not include solvents used in cold cleaners, vapor degreasers, conveyorized degreasers or film cleaning machines, or solvents that are incorporated into, or used exclusively in the manufacture or construction of, the goods or commodities at the site of the establishment.

"Nail Polish Remover" means a product designed to remove nail polish and coatings from fingernails or toenails.

"Nonresilient Flooring" means flooring of a mineral content which is not flexible. "Nonresilient Flooring" includes terrazzo, marble, slate, granite, brick, stone, ceramic tile and concrete.

"Non-Selective Terrestrial Herbicide" means a terrestrial herbicide product that is toxic to plants without regard to species.

"Oven Cleaner" means any cleaning product designed to clean and to remove dried food deposits from oven walls.

"Paint Remover or Stripper" means any product designed to strip or remove paints or other related coatings, by chemical action, from a substrate without markedly affecting the substrate. "Paint Remover or Stripper" does not include "Multi-purpose Solvents," paint brush cleaners, products designed and labeled exclusively ~~to remove~~ as "Ggraffiti Removers," and hand cleaner products that claim to remove paints and other related coatings from skin.

"Paint Thinner" means any volatile liquid used for reducing the viscosity of coating compositions or components.

"Penetrant" means a lubricant designed and labeled primarily to loosen metal parts that have bonded together due to rusting, oxidation, or other causes. "Penetrant" does not include "Multi-purpose Lubricants" that claim to have penetrating qualities, but are not labeled primarily to loosen bonded parts.

"Personal Fragrance Product" means any product which is applied to the human body or clothing for the primary purpose of adding a scent or masking a malodor, including cologne, perfume, aftershave, and toilet water. "Personal Fragrance Product" does not include: (A) Deodorant, as defined in section ~~94510(d)~~ 94501(d), ~~products exclusively for human axillae~~; (B) medicated products designed primarily to alleviate fungal or bacterial growth on feet or other areas of the body; (C) mouthwashes, breath fresheners and deodorizers; (D) lotions, moisturizers, powders or other skin care products used primarily to alleviate skin conditions such as dryness and irritations; (E) products designed exclusively for use on human genitalia; (F) soaps, shampoos, and products primarily used to clean the human body; and (G) fragrance products designed to be used exclusively on non-human animals.

"Pressurized Gas Duster" means a pressurized product labeled to remove dust from a surface solely by means of mass air or gas flow, including surfaces such as photographs, photographic film negatives, computer keyboards, and other types of surfaces that cannot be cleaned with solvents. "Pressurized Gas Duster" does not include "Dusting Aid."

"Rubber and Vinyl Protectant" means any product designed to protect, preserve or renew vinyl, rubber, and plastic on vehicles, tires, luggage, furniture, and household products such as vinyl covers, clothing, and accessories. "Rubber and Vinyl Protectant" does not include products primarily designed to clean the wheel rim, such as aluminum or magnesium wheel cleaners, and tire cleaners that do not leave an appearance-enhancing or protective substance on the tire.

"Rubbing Alcohol" means any product containing isopropyl alcohol (also called isopropanol) or denatured ethanol and labeled for topical use, usually to decrease germs in minor cuts and scrapes, to relieve minor muscle aches, as a rubefacient, and for massage.

"Sealant and Caulking Compound" means any product with adhesive properties that is designed to fill, seal, waterproof, or weatherproof gaps or joints between two surfaces. "Sealant and Caulking Compound" does not include roof cements and roof sealants; insulating foams; removable caulking compounds; clear/paintable/water resistant caulking compounds; floor seam sealers; products designed exclusively for automotive uses; or sealers that are applied as continuous coatings. "Sealant and Caulking Compound" also does not include units of product, less packaging, which weigh more than one pound and consist of more than 16 fluid ounces. For the purposes of this definition only, "removable caulking compounds" means a compound which temporarily seals windows or doors for three to six month time intervals, and "clear/paintable/water resistant caulking compounds" means a compound which contains no appreciable level of opaque fillers or pigments; transmits most or all visible light through the caulk when cured; is paintable; and is immediately resistant to precipitation upon application.

"Shaving Cream" means an aerosol product which dispenses a foam lather intended to be used with a blade or cartridge razor, or other wet-shaving system, in the removal of facial or other bodily hair. "Shaving Cream" does not include "Shaving Gel."

"Shaving Gel" means an aerosol product which dispenses a post-foaming semi-solid designed to be used with a blade, cartridge razor, or other shaving system in the removal of facial or other bodily hair. "Shaving Gel" does not include "Shaving Cream."

"Silicone-based Multi-purpose Lubricant" means any lubricant which is: (A) designed and labeled to provide lubricity primarily through the use of silicone compounds including, but not limited to, polydimethylsiloxane, and (B) designed and labeled for general purpose lubrication, or for use in a wide variety of applications. "Silicone-based Multi-purpose Lubricant" does not include products designed and labeled exclusively to release manufactured products from molds.

"Single Phase Aerosol Air Freshener" means an aerosol air freshener with the liquid contents in a single homogeneous phase and which does not require that the product container be shaken before use.

"Spot Remover" means any product ~~designed~~ labeled to clean localized areas, or remove localized spots or stains on cloth or fabric such as drapes, carpets, upholstery, and clothing, that does not require subsequent laundering to achieve stain removal. "Spot Remover" does not include "Dry Cleaning Fluid", "Laundry Prewash", "Carpet and Upholstery Cleaner", or "Multi-purpose Solvent".

"Special Purpose Spray Adhesive" means an aerosol adhesive that meets any of the following definitions:

(A) "Mounting adhesive" means an aerosol adhesive designed to permanently mount photographs, artwork, and any other drawn or printed media to a backing (paper, board, cloth, etc.) without causing discoloration to the artwork.

(B) "Flexible vinyl adhesive" means an aerosol adhesive designed to bond flexible vinyl to substrates. Flexible vinyl means a nonrigid polyvinyl chloride plastic with at least five percent, by weight, of plasticizer content. A plasticizer is a material, such as a high boiling point organic solvent, that is incorporated into a vinyl to increase its flexibility, workability, or distensibility, and may be determined using ASTM Method E260-91 or from product formulation data.

(C) "Polystyrene Foam Adhesive" means an aerosol adhesive designed to bond polystyrene foam (e.g. Styrofoam®, expanded polystyrene foam, etc.) to substrates.

(D) "Automobile Headliner Adhesive" means an aerosol adhesive designed to bond together layers in motor vehicle headliners.

(E) "Polyolefin Adhesive" means an aerosol adhesive designed to bond polyolefins (e.g. polyethylene, polypropylene, etc.) to substrates.

(F) "Laminate Repair/Edgebanding Adhesive" means an aerosol adhesive designed for:

(1) the touch-up or repair of items laminated with high pressure laminates (e.g. lifted edges, delaminations, etc.), or for
(2) the touch-up, repair, or attachment of edgebanding materials, including, but not limited to, other laminates, synthetic marble, veneers, wood moulding, and decorative metals.

For the purposes of this definition "high pressure laminate" means sheet materials which consist of paper, fabric, or other core material that have been laminated at temperatures exceeding 265 degrees F, and at pressures between 1,000 and 1,400 psi.

(G) "Automotive Engine Compartment Adhesive" means an aerosol adhesive designed for use in motor vehicle under-the-hood applications which require oil and plasticizer resistance, as well as high shear strength, at temperatures of 200-275° F.

"Spray Buff Product" means a product designed to restore a worn floor finish in conjunction with a floor buffing machine and special pad.

"Tire Sealant and Inflator" means any pressurized product that is designed to temporarily inflate and seal a leaking tire.

"Toilet/Urinal Care Product" means any product designed or labeled to clean and/or to deodorize toilet bowls, toilet tanks, or urinals. Toilet bowls, toilet tanks, or urinals includes, but is not limited to, toilets or urinals connected to permanent plumbing in buildings and other structures, portable toilets or urinals placed at temporary or remote locations, and toilet or urinals in vehicles such as buses, recreational motor homes, boats, ships, and aircraft. "Toilet/Urinal Care Product" does not include "Bathroom and Tile Cleaner" or "General Purpose Cleaner."

"Undercoating" means any aerosol product designed to impart a protective, non-paint layer to the undercarriage, trunk interior, and/or firewall of motor vehicles to prevent the formation of rust or to deaden sound. "Undercoating" includes, but is not limited to, rubberized, mastic, or asphaltic products.

"Wasp and Hornet Insecticide" means any insecticide product that is designed for use against wasps, hornets, yellow jackets or bees by allowing the user to spray from a distance a directed stream or burst at the intended insects, or their hiding place.

"Waterproofer" means a product designed and labeled exclusively to repel water from fabric or leather substrates. "Waterproofer" does not include "Fabric Protectants".

"Web Spray Adhesive" means any aerosol adhesive which is not a mist spray adhesive or special purpose spray adhesive.

"Wood Cleaner" means a product labeled to clean wooden materials including but not limited to decking, fences, flooring, logs, cabinetry, and furniture. "Wood Cleaner" does not include "Dusting Aid," General Purpose Cleaner," "Furniture Maintenance Product," "Floor Wax Stripper," "Floor Polish or Wax," or products designed and labeled exclusively to preserve or color wood.

"Wood Floor Wax" means wax-based products for use solely on wood floors.

RELATED DEFINITIONS

The definitions in this section clarify italicized terms used throughout the survey packet. Strikeout/underline format reflects changes from the 2004 Consumer Products Regulation Amendments that have not yet been approved by the California Office of Administrative Law (OAL).

Aerosol Coating Product means a pressurized coating product containing pigments or resins that dispenses product ingredients by means of a propellant, is package in a disposable can for hand-held applications, and is regulated by the Regulation for Reducing the Ozone Formed From Aerosol Coating Product Emissions, title 17, California Code of Regulations, Sections 94520-94528 and Sections 94700-94701.

Aerosol Product[1] means a pressurized spray system that dispenses product ingredients by means of a propellant contained in a product or a product's container, or by means of a mechanically induced force. "Aerosol Product" does not include ~~pump sprays~~ "Pump Spray".

Agricultural Use[1] means the use of any pesticide or method or device for the control of pests in connection with the commercial production, storage or processing of any animal or plant crop. "Agricultural Use" does not include the sale or use of pesticides in properly labeled packages or containers which are intended for: (A) Home use, (B) Use in structural pest control, or (C) Industrial or Institutional use. For the purposes of this definition only:

> "Home use" means use in a household or its immediate environment.
>
> "Structural pest control" means a use requiring a license under Chapter 14 (commencing with Section 8500), Division 3, of the Business and Professions Code.
>
> "Industrial use" means use for or in a manufacturing, mining, or chemical process or use in the operation of factories, processing plants, and similar sites.
>
> "Institutional use" means use within the lines of, or on property necessary for the operation of buildings such as hospitals, schools, libraries, auditoriums, and office complexes.

All Other Carbon-Containing Compounds[1] means all other compounds which contain at least one carbon atom and are not a "Table B" or a "LVP-VOC."

Architectural Coating means a coating 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 application or to non-stationary structures such as airplanes, ships, boats, railcars, and automobiles, and adhesives are not considered architectural coatings.

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

Article means products manufactured solely from, or any combination of, paper, glass, wood, rubber, metal, fabrics, felts, or plastics. Examples include combs, toothbrushes, paperclips, hair dryers, and paint brushes. *Article* does not include liquid-impregnated products such as wipes, towels, cloths, sheets, or pads.

ASTM[1] means the American Society for Testing and Materials.

Brake fluid means automotive hydraulic brake fluid that complies with United States Department of Transportation DOT 3, DOT 4, or DOT 5 requirements, and is rated with a dry boiling point greater than 216 degrees Celsius (421 degrees Fahrenheit).

California Sales[1] means the sales (net pounds of product, less packaging and container, per year) in California for either the calendar year immediately prior to the year that the ~~registration~~ information required by the Executive Officer pursuant to section 94513 (required information) is due or, if that data is not available, any consecutive 12 month period commencing no earlier than 2 years prior to the due date of the ~~registration~~ required information. If direct sales data for California is not available, sales may be estimated by prorating national or regional sales data by population.

Colorant[1] means any pigment or coloring material used in a consumer product for an aesthetic effect, or to dramatize an ingredient.

Commercial dry cleaning fluid means any non-aqueous liquid product designed and labeled exclusively to clean "dry clean only" fabrics or an upholstery fabric designed to be cleaned only with water-free spot cleaning products, either of which is used in a business that provides a service for profit. *Commercial dry cleaning fluid* does not include "Spot Remover" or "Carpet and Upholstery Cleaner."

Commercial Product, for the purposes of this survey, has the same definition as "Institutional Product". See "Institutional Product" definition.

Concentrate means a product sold in a condensed form, that has usage instructions on the label that direct the end user to dilute the product with a diluent, such as water or another solvent.

Consumer[1] means any person who seeks, purchases, or acquires any consumer product for personal, family, household, or institutional use. Persons acquiring a consumer product for resale are not "consumers" for that product.

Consumer Product[1] 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 article, the term "consumer product" shall also refer to aerosol adhesives, including aerosol adhesives used for consumer, industrial, and commercial uses.

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

Contract Employee means a person hired by a company to sell that company's goods or products for an agreed upon commission or fee.
Contract Packager means a company/person that manufactures or packages products for another company.

Device[1] means any instrument or contrivance (other than a firearm) which is designed for trapping, destroying, repelling, or mitigating any pest or any other form of plant or animal life (other than man and other than bacteria, virus, or other microorganism on or in living man or other living animals); but not including equipment used for the application of pesticides when sold separately therefrom.

Diluent means a substance, such as water or another solvent, that is used to dilute a concentrate prior to use as indicated on the label.

Distributor[1] means any person to whom a consumer product is sold or supplied for the purposes of resale or distribution in commerce, except that manufacturers, retailers, and consumers are not distributors.

Executive Officer[1] means the Executive Officer of the Air Resources Board, or his or her delegate.

Fat Wood[1] means pieces of wood kindling with high naturally-occurring levels of sap or resin which enhance ignition of the kindling. "Fat wood" does not include any kindling with substances added to enhance flammability, such as wax-covered or wax-impregnated wood-based products.

Floor Coating[1] means an opaque coating that is labeled and designed for application to flooring, including but not limited to, decks, porches, steps, and other horizontal surfaces which may be subject to foot traffic.

Foam/mousse means a substance that is comprised of two phases: a dispersed gas or vapor phase, and a continuous liquid phase, therein creating a mass of gaseous cells that is separated by thin films of liquid and formed by the juxtaposition of bubbles.

Formulator means a company/person, other than the *responsible party*, that holds the ingredient information for a product.

Fragrance[1] means a substance or complex mixture of aroma chemicals, natural essential oils, and other functional components with a combined vapor pressure not in excess of 2 mm of Hg at 20°C, the sole purpose of which is to impart an odor or scent, or to counteract a malodor.

Fuel additive means a liquid product that is introduced directly into the fuel lines or fuel tank of a reciprocating internal combustion engine for the purpose of improving engine performance, cleaning internal engine or fuel system parts, removing water from the fuel lines or fuel tank, or stabilizing fuel during storage.

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

Furniture Coating means any product designed to leave a permanent finish including paints, stains, sanding sealers, and lacquers designed for application to furnishings including, but not limited to, cabinets (kitchen, bath, and vanity), tables, chairs, beds, and sofas.

Gel[1] means a colloid in which the disperse phase has combined with the continuous phase to produce a semisolid material, such as jelly.

Gross Annual Receipts means the overall total income of a company before expenses are deducted.

Herbicide[1] means a pesticide product designed to kill or retard a plant's growth, but excludes products that are: (A) for agricultural use, or (B) restricted materials that require a permit for use and possession.

Household Product[1] means any consumer product that is primarily designed to be used inside or outside of living quarters or residences that are occupied or intended for occupation by individuals, including the immediate surroundings.

Hydrocarbon Solvent means a single compound, such as hexane, or a complex mixture of compounds such as alkanes, branched alkanes, cycloalkanes, and aromatics that contain only the elements hydrogen and carbon (e.g. mineral spirits, naphtha, petroleum distillates, xylenes, stoddard solvent, aromatic 100/150). Organic compounds containing other elements, such as oxygen (e.g. alcohols and glycol ethers) are not hydrocarbon solvents.

Independently Owned means controlled by one self. Not dependent on another for financial support.

Industrial Product means a consumer product that is incorporated into or used exclusively in the manufacture or construction of the goods or commodities at the site of the establishment.

Institutional Product[1] or "Industrial and Institutional (I&I) Product" means a consumer product that is designed for use in the maintenance or operation of an establishment that: (A) manufactures, transports, or sells goods or commodities, or provides services for profit; or (B) is engaged in the nonprofit promotion of a particular public, educational, or charitable cause. "Establishments" include, but are not limited to, government agencies, factories, schools, hospitals, sanitariums, prisons, restaurants, hotels, stores, automobile service and parts centers, health clubs, theaters, or transportation companies. "Institutional Product" does not include household products and products that are incorporated into or used exclusively in the manufacture or construction of the goods or commodities at the site of the establishment.

Label[1] means any written, printed, or graphic matter affixed to, applied to, attached to, blown into, formed, molded into, embossed on, or appearing upon any consumer product or consumer product package, for purposes of branding, identifying, or giving information with respect to the product or to the contents of the package.

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

Laboratory Reagents means chemicals used for purposes of commercial, industrial, or academic research and development within an established area dedicated to scientific experimentation.

Liquid[1] means a substance or mixture of substances which is capable of a visually detectable flow as determined under ASTM D-4359-90. "Liquid" does not include powders or other materials that are composed entirely of solid particles.

LVP-VOC[1] means a chemical "compound" or "mixture" that contains at least one carbon atom and meets one of the following:

(A) has a vapor pressure less than 0.1 mm Hg at 20°C, as determined by ARB Method 310; or
(B) is a chemical "compound" with more than 12 carbon atoms, or a chemical "mixture" comprised solely of "compounds" with more than 12 carbon atoms as verified by formulation data, and the vapor pressure and boiling point are ~~is~~ unknown; or
(C) is a chemical "compound" with a boiling point greater than 216°C, as determined by ARB Method 310; or
(D) is the weight percent of a chemical "mixture" that boils above 216°C, as determined by ARB Method 310.

For the purposes of the definition of LVP-VOC, chemical "compound" means a molecule of definite chemical formula and isomeric structure, and chemical "mixture" means a substrate comprised of two or more chemical "compounds".

Manufacturer means a company/person that imports, manufactures, assembles, produces, packages, repackages, or relabels a consumer product.

Marketer means a company/person that contracts out the manufacturing of their products.

Mist/dispersed spray means a substance that, upon being dispensed, generally yields a uniform application of discrete particles or droplets.

Non-Carbon Containing Compound[1] means any compound which does not contain any carbon atoms.

Other Paint Product means any liquid product applied to any surface and designed to leave a permanent finish, including paints, stains, sanding sealers, varnishes, and lacquers.

Overfill means the amount of product in a container that exceeds the mass or volume stated on the product label by 2% or more.

Paint[1] means any pigmented liquid, liquefiable, or mastic composition designed for application to a substrate in a thin layer which is converted to an opaque solid film after application and is used for protection, decoration or identification, or to serve some

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

functional purpose such as the filling or concealing of surface irregularities or the modification of light and heat radiation characteristics.

Parent Company means the company or corporation that owns and controls other companies.

Partial LVP-VOC means the weight percent of a chemical "mixture" that boils above 216° C as determined by ARB Method 310.

Person[1] shall have the same meaning as defined in Health and Safety Code Section 39047.

Pesticide[1] means and includes any substance or mixture of substances labeled, designed, or intended for use in preventing, destroying, repelling or mitigating any pest, or any substance or mixture of substances labeled, designed, or intended for use as a defoliant, desiccant, or plant regulator, provided that the term "pesticide" will not include any substance, mixture of substances, or device which the United States Environmental Protection Agency does not consider to be a pesticide.

Pet care product means a consumer product intended for use on domestic animals, including but not limited to dogs, cats, horses, birds, reptiles, and rodents. *Pet care product* does not include products intended solely for use on animals kept for commercial purposes, such as livestock.

Post-foaming gel means a semisolid that upon being dispensed from its container or upon contact with a surface, or as a result of exposure to body heat or the atmosphere, changes from a semisolid state to a foaming state. "Post-foaming gel" does not include substances that become foam solely from shearing action after being dispensed, such as rubbing the product on the skin or other agitation.

Principal Display Panel or Panels[1] means that part, or those parts of a label that are so designed as to most likely be displayed, presented, shown or examined under normal and customary conditions of display or purchase. Whenever a principal display panel appears more than once, all requirements pertaining to the "principal display panel" shall pertain to all such "principal display panels".

Product Brand Name[1] means the name of the product exactly as it appears on the principal display panel of the product.

Product Group means a group of products represented together for the purposes of this survey that differ only by size, color, botanical/herbal extract, and/or fragrance, and meet all of the following grouping requirements:

1) All products must have the same Category Code(s);
2) All products must be the same dispensed form (e.g. liquid, solid, mist/dispersed spray etc., from the choices in item 6 on FORM 3); and
3) Grouped products must have no greater than two percent variation in total VOC content, where the difference is only due to the type or amount of fragrance, colorant, or botanical/herbal extracts.

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

Propellant[1] means a liquefied or compressed gas that is used in whole or in part, such as a cosolvent, to expel a liquid or any other material from the same self-pressurized container or from a separate container.

Pump Spray[1] means a packaging system in which the product ingredients within the container are not under pressure and in which the product is expelled only while a pumping action is applied to a button, trigger or other actuator.

Responsible Party means the company, firm, or establishment listed on the label of a consumer or commercial product reportable under this survey that was sold with intention for use in California during Calendar Year 2003. If the label lists two companies, firms, or establishments, the responsible party is the party that the product was "manufactured for" or "distributed by," as noted on the label.

Restricted Materials[1] means pesticides established as restricted materials under Title 3, California Code of Regulations, section 6400.

Retailer means a company/person who sells, supplies, or offers consumer products for sale directly to consumers.

Retail Outlet[1] means any establishment at which consumer products are sold, supplied, or offered for sale directly to consumers.

Semisolid[1] means a product that, at room temperature, will not pour, but will spread or deform easily, including but not limited to gels, pastes, and greases.

Solid[1] means a substance or mixture of substances which, either whole or subdivided (such as the particles comprising a powder), is not capable of visually detectable flow as determined under ASTM D-4359-90.

Terrestrial[1] means to live on or grow from land.

"Type A" windshield washer solution is any windshield washer solution that is sold for the intention of use in Alpine, Amador, Calaveras, Del Norte, El Dorado, Inyo, Lassen, Mariposa, Modoc, Mono, Nevada, Placer, Plumas, Trinity, Tuolumne, Shasta, Sierra, or Siskiyou Counties including Lake Tahoe, but does not include fluids that are placed in new motor vehicles at the time of manufacture.

Usage Directions[1] means the text or graphics on the product's principal display panel, label, or accompanying literature which describes to the end user how and in what quantity the product is to be used.

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

Volatile Organic Compound (VOC)[1] 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:

(A) methane,
methylene chloride (dichloromethane),
1,1,1-trichloroethane (methyl chloroform),
trichlorofluoromethane (CFC-11),
dichlorodifluoromethane (CFC-12),
1,1,2-trichloro-1,2,2-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:

1. cyclic, branched, or linear, completely fluorinated alkanes;
2. cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;
3. cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and
4. sulfur-containing perfluorocarbons with no unsaturations and with the sulfur bonds to carbon and fluorine, and

(B) 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),
perchloroethylene (tetrachloroethylene).

VOC Content[1] means the total weight of VOC in a product expressed as a percentage of the product weight (exclusive of the container or packaging), as determined pursuant to sections 94515(a) and (b).

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

Wax[1] means a material or synthetic thermoplastic substance generally of high molecular weight hydrocarbons or high molecular weight esters of fatty acids or alcohols, except glycerol and high polymers (plastics). "Wax" includes, but is not limited to, substances derived from the secretions of plants and animals such as carnuba wax and beeswax, substances of a mineral origin such as ozocerite and paraffin, and synthetic polymers such as polyethylene.

[1] This wording is exactly as it appears in The California Consumer Products Regulation (Title 17, California Code of Regulations, Sections 94500-94506.5, 94507-94517, or 94520-94528).

PART VIII:
Special Reporting Requirements for Aerosol Adhesives

REQUIREMENTS FOR AEROSOL ADHESIVE RESPONSIBLE PARTIES

Section 94513(d) of the Consumer Products Regulation requires *responsible parties* for *aerosol adhesives* to provide written updates on research and development (R&D) efforts undertaken to achieve *VOC* limits lower than those specified in the regulation (title 17, California Code of Regulations, Division 3, Chapter 1, Subchapter 8.5, Article 2, Consumer Products, sections 94507 – 94517). The update must include detailed information about the raw materials (solvents, *propellants*, resins, and polymers) and hardware (valves, actuators, and cans) used in product reformulation, testing protocols used, test results, and the cost of reformulation efforts.

In a letter dated December 19, 2003, to consumer product stakeholders, the ARB stated that, to simplify the reporting process, the request for *responsible parties* to report the information required by section 94513(d) would be incorporated into the 2003 Consumer & Commercial Products Survey. **This update on R&D efforts is for the time period after the adoption of the amendments to the aerosol adhesives requirements, May 25, 2000, to the present.** Completion of Forms AA-1 through AA-3 along with submittal of other requested information, as noted on the bottom of Form AA-3, fulfills the reporting requirement of Section 94513(d). The ARB reserves the right to require further information for purposes of clarification.

GENERAL INSTRUCTIONS FOR FORMS AA-1 THROUGH AA-3

Additional Forms AA-1, AA-2, and AA-3 may be printed from the electronic version of survey. However, the electronic versions of Forms AA-1, AA-2, and AA-3 are not interactive. Responsible parties will need to fill in and submit hardcopy versions of these forms.

1) List all *aerosol adhesive* products on Form AA-1. Use the same Product Tracking # and Full Product Name as appears on Survey FORM 3. Indicate whether or not an R&D Effort was conducted for each product listed. For those products for which an R&D Effort was not conducted, specify the reasons for not conducting the R&D Effort.

2) Complete one Form AA-2 for each *aerosol adhesive* product listed in Form AA-1. Use the same Product Tracking # and Full Product Name as appears on Survey FORM 3. Copy additional Form AA-2s, as needed.

3) Complete one Form AA-3 for each R&D Effort and include a list of the *aerosol adhesive* products covered by the R&D Effort. Copy as many Form AA-3s as needed. Include the testing protocols used, all final test results, and a summary of future R&D plans with this form.

4) Return all completed forms and other required information with the 2003 Consumer and Commercial Products Survey.

SPECIAL REPORTING REQUIREMENTS FOR AEROSOL ADHESIVES

AEROSOL ADHESIVES: SPECIAL REPORTING REQUIREMENTS

Check (√) if Confidential ☐

FORM AA-1 -- List of Aerosol Adhesive Products

Instructions: List all aerosol adhesive products below. Use the same Product Tracking # and Full Product Name as appears on FORM 3. Indicate whether or not an R&D Effort was conducted for each product listed. For those products for which an R&D effort was not conducted, specify the reasons for not conducting the R&D Effort.

Responsible Party: _____

Contact Person: _____ **Phone:** _____ **Fax:** _____

Title: _____ **Email:** _____

Please List Your Aerosol Adhesive Products (Copy Form AA-1 if extra space is required.)

Product Tracking #	Full Product Name:	R&D Effort yes/no

Justification for Not Conducting R&D Efforts: _____

Comments: _____

CALIFORNIA AIR RESOURCES BOARD *** 2003 CONSUMER & COMMERCIAL PRODUCTS SURVEY

AEROSOL ADHESIVES: SPECIAL REPORTING REQUIREMENTS

Check (√) if Confidential ❑

FORM AA-2 -- Aerosol Adhesive Product Description

Complete one Form AA-2 for each aerosol adhesive product listed in Form AA-1. Use the same Product Tracking # and Full Product Name as it appears on FORM 3. Copy additional Form AA-2s, as needed, and return all completed forms with the 2003 Consumer Products Survey.

Responsible Party: _____

Formulator (if applicable): _____

Product Tracking #: _____

Full Product Name: _____

Aerosol Adhesive Category: [] Mist Spray Adhesive [] Web Spray Adhesive or [] Special Purpose Spray Adhesive

NOTE: If the Special Purpose Spray Adhesive box was checked, please complete the following items to identify the product category and spray pattern type.

Product Category: (Check One.)

[] Mounting adhesives
[] Automotive engine compartment adhesives
[] Flexible vinyl adhesives
[] Polystyrene foam adhesives
[] Automobile headliner adhesives
[] Polyolefin adhesives
[] Laminate repair/edgebanding adhesives

Spray Pattern Type: [] Lace/Web or [] Particle/Mist

Product Application: Check all that apply for this product.

[] Automotive [] General Purpose [] High Performance [] Mounting [] Repositionable before curing

[] Other (Describe.)_____

Substrate for which the product is designed or labeled: Check all that apply for this product.

[] Cardboard
[] Ceramic
[] Expanded Polystyrene Foam
[] Fabric
[] Fiberglass
[] Glass
[] High Pressure Laminate
[] Leather
[] Metal
[] Paper
[] Rubber
[] Styrofoam
[] Vinyl
[] Wood
[] Other _____

Comments: _____

CALIFORNIA AIR RESOURCES BOARD *** 2003 CONSUMER & COMMERCIAL PRODUCTS SURVEY

AEROSOL ADHESIVES: SPECIAL REPORTING REQUIREMENTS

Check (√) if Confidential ❑

FORM AA-3 Summary of R&D Efforts

Complete one Form AA-3 for each R&D Effort and include a list of aerosol adhesive products covered by the R&D Effort. Copy as many Form AA-3s, as needed, and return all completed forms with the 2003 Consumer Products Survey.

Responsible Party: _____

R&D Effort Focus:
[] Raw Materials: [] polymers [] propellants [] resins [] solvents [] other
[] Hardware: [] actuators [] valves [] cans [] other

Time Period: (mm/yyyy) From: _____ To: _____

Cost: Item	Financial Investment	Time Investment
analysis	$ _____	person years _____
materials	$ _____	person years _____
overhead	$ _____	person years _____
personnel	$ _____	person years _____
other	$ _____	person years _____
Total Costs	$ _____	person years _____

R&D Goal: _____

Variables: _____

Results: _____

Product Tracking #:	**Full Product Name:**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Include the testing protocols used, all final test results, and a summary of future R&D plans with this form.

PART IX:
Voluntary Survey Evaluation

VOLUNTARY SURVEY EVALUATION

This survey will be used to create future surveys and it is important to ARB that all surveys are easy to understand and use. Please help us further improve survey format by evaluating this survey packet.

Please note, the information you provide on this evaluation will not be associated with the data you provide on other survey forms. To comment on specific company or product information, use the comment spaces on FORMs 1 and 3 respectively.

Circle one answer for each statement. Use "n/a" if the question does not apply.

		strongly agree				*strongly disagree*
1. The survey material was arranged in logical order.	n/a	1	2	3	4	5
2. After reading Parts I-III of the packet, I felt prepared to complete the survey forms.	n/a	1	2	3	4	5
3. The flowchart on page III-6 was helpful.	n/a	1	2	3	4	5
4. The checklist on page III-10 was helpful.	n/a	1	2	3	4	5
5. The forms were easy to understand and follow.	n/a	1	2	3	4	5
6. Having the instructions located on the back of the forms was helpful.	n/a	1	2	3	4	5
7. The instructions were helpful and easy to understand.	n/a	1	2	3	4	5
8. I found Attachments E, F, and G to be useful in completion of FORM 4 - Ingredient Information.	n/a	1	2	3	4	5

Specific comments regarding above questions:_____

Suggestions for making the survey more user-friendly or otherwise improving the survey:_____

What would you estimate to be the total number of <u>hours</u> spent by your company (and other companies that assisted you) to complete this survey?_____

What would you estimate to be the total <u>cost ($)</u> for your company (and other companies that assisted you) to complete this survey?_____

If additional space is needed, please attach an additional page. Thank you for completing this evaluation.

APPENDIX E:
Summary of Regulations Adopted and Dates of Regulatory Amendments

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Effective Date	Site	Comments
6/16/89	Consumer Products Control Plan.	N/A	N/A	First Board action on consumer products. Board approved overall plan to fulfill HSC Section 41712 mandate and a goal of achieving a 50 percent reduction in VOC emissions from consumer products.
11/8/89	Regulation to Reduce VOC Emissions from Antiperspirants and Deodorants.	2/27/91	Article 2, Sections 94500-94506, Title 17, CCR.	First consumer product regulation adopted pursuant to the CCAA. Established VOC content limits for aerosol and non-aerosol antiperspirants and deodorants.
6/15/90	Regulation for Reducing VOC Emissions from Consumer Products in the Bay Area AQMD.	N/A	Article 2, Consumer Products, Sections 94520-94527, Title 17, CCR.	This regulation was adopted to reduce VOC emissions from consumer products in the Bay Area AQMD and establishes VOC limits for 6 consumer products.
10/11/90	Regulation for Reducing VOC Emissions from Consumer Products - Phase I.	10/21/91	Article 2, Consumer Products, Sections 94507-94516 and 94503.5, Title 17, CCR Amendments to Article 2, Section 94505, Title 17, CCR	Establishes VOC limits for 16 consumer products, repeals the Bay Area consumer product regulation, and amends the AP/DO regulation to include an innovative product provision and a revised variance procedure.
1/9/92	Adoption of Amendments to the Regulation for Reducing VOC Emissions from Consumer Products - Phase II.	1/6/93	Article 2, Consumer Products, Sections 94507-94517, Title 17, CCR.	Establishes standards for 10 additional categories of consumer products and several amendments to the existing regulation for clarification and improvement.
9/22/94	Adoption of the Alternative Control Plan Regulation for Consumer Products.	9/9/95	Article 4, Sections 94540-94555, Title 17, CCR.	A voluntary market-based regulation which supplements the existing consumer products regulation by providing manufacturers with additional flexibility for formulating products.
11/15/94	Approval of the California State Implementation Plan for Ozone.	2/14/95	N/A	Board approval of Ozone SIP which includes consumer products element comprised of near, midterm, and long term measures.

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Effective Date	Site	Comments
3/23/95	Regulation for Reducing VOC Emissions from Aerosol Coating Products and Amendments to the Alternative Control Plan.	1/8/96	Article 3, Sections 94520-94528, Title 17, CCR Amendments to Article 4, Sections 94540 to 94543, 94547, 94550, 94551, and 94553, Title 17, CCR.	Establishes VOC content limits for 35 categories of aerosol paints. Amendments to ACP to incorporate aerosol coating products.
9/28/95	Amendments to the California Regulations for Reducing VOC Emissions from Antiperspirants and Deodorants, Consumer Products, and Aerosol Coating Products.	2/29/96	Amendments to Article 1, Sections 94500-94504, Title 17, CCR, Article 2, Section 94508(a)(90), Title17, CCR, and Article 3, Section 94521(a)(62), Title 17, CCR.	The amendments to the AP/DO regulation address fairness concerns, preserves projected emission reductions required by the SIP, ensures that manufacturers will continue their efforts to develop zero percent products and provides a vehicle to monitor progress and to make the VOC definition more consistent with EPA's VOC definition. The consumer products regulation and the aerosol coatings regulation is modified to revise the VOC definition consistent with EPA's.
11/21/96	Amendments to the California Regulations for Reducing VOC Emissions from Consumer Products and Aerosol Coating Products.	11/18/97	Amendments to Article 2; Sections 94508, 94515 94517 and Article 3; Section 94521, Title 17, CCR.	The amendments to the consumer products regulation address postponement of the 25 percent standard for aerosol adhesives, modification to the VOC definition, amendment of various regulatory provisions to enhance clarity and compliance, and amendment to the test methods sections. The proposed amendments also modify the VOC definition in the aerosol coatings regulation.
3/27/97	Amendments Pertaining to Hairspray in the California Consumer Products Regulation.	8/24/98	Amendments to Article 2, Sections 94509, 94513, and 94514,Title 17, CCR.	Postpones the hairspray 55 percent VOC standard from 1/1/98 to 6/1/99, require plans demonstrating progress toward compliance from manufacturers selling hairspray not meeting the 55 percent VOC standard from 1/1/98 to 6/1/99, and modifies the variance provision to include a requirement for VOC emissions mitigation when granting a variance request for hairsprays from the 6/1/99 standard.

Summary of Consumer Products Regulatory Actions

Date	Regulatory Action	Effective Date	Site	Comments
7/24/97	Amendments to the Consumer Products Regulation, Mid-term Measures I.	7/1/98	Amendments to Article 2, Sections 94508, 94509, 94510, 94512, 94513, and 94514, Title 17, CCR.	All VOC standards with 1/1/2000, effective dates were extended to 1/1/2001; First tiers of the two-tiered VOC standards and additional reporting requirements for four product categories were eliminated; Effective dates of the VOC standard were changed for five product categories.
11/19/98	Amendments to the Aerosol Coating Products, the Antiperspirants and Deodorants Regulation, and the Consumer Products Regulation.	6/24/99	Amendments to Article 3, Section 94521, 94522, and 94524, Title 17, CCR; Article 1, Section 94501, Title 17, CCR; and to Article 2, Section 94508(a)(124), Title 17, CCR.	Relaxation of the second-tier VOC limits of the Aerosol Coating Products Regulation. Exemption of methyl acetate from the VOC definition in the Antiperspirants and Deodorants Regulation, the Consumer Products Regulation, and the Aerosol Coating Products Regulation.
10/28/99	Amendments to the Consumer Products Regulation, Mid-term Measures II.	11/19/2000	Amendments to Article 2, Section 94508, 94509, and 94513.	Amends the Consumer Products Regulation by adding product category definitions, VOC limits for two new categories, more stringent VOC limits for fifteen existing categories, and adding subcategories for some of the existing product categories with separate VOC limits for each subcategory. New or modified VOC limits become effective from 12/31/2000, to 12/31/2004. Amendments consolidates and expands the existing reporting requirements for products containing methylene chloride or perchloroethylene.
5/25/2000	Amendments to the Consumer Products Regulation relating to Aerosol Adhesives.	5/18/2001	Amendments to Article 1, Sections 94508, 94509, 94512, and 94513, Title 17, CCR.	Amendments eliminate the 25 percent VOC limit and establish new VOC limits for three new categories of aerosol adhesives, effective January 1, 2002. Amendments also include labeling and other requirements to facilitate compliance and enforcement of the new standards. Effective 1/1/2002, amendments also prohibit the use of methylene chloride, perchloroethylene, and trichloroethylene, which are toxic air contaminants, in aerosol adhesives manufactured for use in California.

Summary of Consumer Products Regulatory Actions

6/22/2000	Consumer Products Relating to Aerosol Coating Products, Proposed Tables of Maximum Incremental Reactivity (MIR) Values, and Amendments to Method 310.	7/18/2001	Amendments to Article 3, Sections 94521, 94522, 94523, 94524, and 94526. Added new sections 94700 and 94701, to Title 17, CCR.	Amendments replace the second tier mass-based VOC limits for 35 product categories with equivalent reactivity-based limits. In addition, a new subchapter, Subchapter 8.6, in title 17, CCR was adopted. New Subchapter 8.6, in sections 94700 and 94701, contains Tables of MIR Values that are used to set reactivity-based limits and determine compliance.
10/26/2000	Amendments to the Regulation to Reduce VOC Emissions from Antiperspirants and Deodorants.	4/24/2001	Amendments to Article 1, Sections 94502 and 94504, Title 17, CCR.	Amendments increased the HVOC limit for aerosol antiperspirants to 40 percent from the current zero percent limit, beginning 1/1/2001. The MVOC limit of 10 percent remains unchanged.
6/24/2004	Amendments to the Consumer Products Regulations, Method 310 and Adoption of Airborne Toxic Control Measure (ATCM) for Para-Dichlorobenzene.	TBD	Amendments to Article 2, Sections 94501, 94506, 94507, 94508, 94509, 94510, 94512, 94513, 94515, and 94526, Title 17, CCR and Amendments to ARB Method 310, which is incorporated by reference in sections 94506, 94515, and 94526, title 17, CCR.	Amendments establishes new VOC limits for 15 product categories. Most of the VOC limits would become effective 12/31/ 2006. The VOC limit for the aerosol "Anti-static Product" category would become effective on 12/31/2008 and a second, future-effective VOC limit for the "Shaving Gel" category would become effective on 12/31/ 2009. Amendments also prohibit the use of three toxic air contaminants--methylene chloride, perchloroethylene, and trichloroethylene--in seven product categories (Adhesive Removers; Contact Adhesives; General Purpose Degreasers; Electrical Cleaners; Electronic Cleaners; Footwear or Leather Care Products; and Graffiti Removers). The ATCM prohibits the use of para-dicholorobenzene in toilet/urinal care products and solid air fresheners. It will also remove the existing exemption for "air fresheners containing at least 98% para-dicholorobenzene" in section 94510(g) of the Consumer Products Regulation.

APPENDIX F:
Summary of Cost Calculations

1055

Low Cost

Category: Construction, Panel and Floor Covering Adhesive
Subcategory: Complying water based

Typical noncomp: 13
Proposed Limit: 7

Average Unit Size 13.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hexane	0.210	5.00	0.01	0.00	0.00
Mineral Spirits	0.950	8.00	0.08	3.00	0.03
Calcium Carbonate	0.120	50.00	0.06	44.00	0.05
Kaolin	0.060	5.00	0.00	5.00	0.00
Titanium Dioxide	1.180	5.00	0.06	0.00	0.00
LVP-polymer/resins	3.500	27	0.95	26.00	0.91
Xylene	0.360			1	0.00
Silica	0.350			1	0.00
Water	0.002			20	0.00
	SUM	100.00		100.00	

Total Cost, $/pound 1.15 1.00

% Cost Diff. Relative to Current Product -13.15

Total Cost, $/Unit 0.94 0.81

Recurring Costs C.E., $/lb VOC Reduced -2.53

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 13.00 ounce

High Cost

Category: Construction, Panel and Floor Covering Adhesive
Subcategory: Complying water based

Typical noncomp: 13
Proposed Limit: 7

Average Unit Size 13.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hexane	0.220	5.00	0.01	0.00	0.00
Mineral Spirits	1.060	8.00	0.08	3.00	0.03
Calcium Carbonate	0.140	50.00	0.07	44.00	0.06
Kaolin	0.140	5.00	0.01	5.00	0.01
Titanium Dioxide	1.180	5.00	0.06	0.00	0.00
LVP-polymer/resins	7.000	27.00	1.89	26.00	1.82
Xylene	0.360	0.00	0.00	1.00	0.00
Silica	0.350	0.00	0.00	1.00	0.00
Water	0.002			20	0.00
	SUM	100.00		100.00	

Total Cost, $/pound 2.12 1.93

% Cost Diff. Relative to Current Product -9.14

Total Cost, $/Unit 1.72 1.57

Recurring Costs C.E., $/lb VOC Reduced -3.23

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 13.00 ounce

1056

Low Cost

Category: Construction, Panel and Floor Covering Adhesive
Subcategory: Complying Solvent Based

Typical noncomp: 13 Average Unit Size 13.00 wt oz
Proposed Limit: 7

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hexane	0.210	5.00	0.01		0.00
Mineral Spirits	0.950	8.00	0.08	5.00	0.05
Calcium Carbonate	0.120	50.00	0.06	56.00	0.07
Kaolin	0.060	5.00	0.00	7.00	0.00
Titanium Dioxide	1.180	5.00	0.06	5.00	0.06
LVP-polymer/resins	3.500	27	0.95	25.00	0.88
Xylene	0.360			2	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	1.15	1.06
% Cost Diff. Relative to Current Product		-8.10
Total Cost, $/Unit	0.94	0.86
Recurring Costs C.E., $/lb VOC Reduced		-1.56

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 13.00 ounce

High Cost

Category: Construction, Panel and Floor Covering Adhesive
Subcategory: Complying Solvent Based

Typical noncomp: 13 Average Unit Size 13.00 wt oz
Proposed Limit: 7

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hexane	0.220	5.00	0.01	0.00	0.00
Mineral Spirits	1.060	8.00	0.08	5.00	0.05
Calcium Carbonate	0.140	50.00	0.07	56.00	0.08
Kaolin	0.140	5.00	0.01	7.00	0.01
Titanium Dioxide	1.180	5.00	0.06	5.00	0.06
LVP-polymer/resins	7.000	27.00	1.89	25.00	1.75
Xylene	0.360	0.00	0.00	2.00	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	2.12	1.96
% Cost Diff. Relative to Current Product		-7.75
Total Cost, $/Unit	1.72	1.59
Recurring Costs C.E., $/lb VOC Reduced		-2.74

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 13.00 ounce

1057

Low Cost

Category: Brake Cleaner
Subcategory: Aerosol

Typical noncomp: 75
Proposed Limit: 10

Average Unit Size 14.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Acetone	0.650	25.00	0.16	0.00	0.00
Carbon Dioxide	0.270		0.00	0.00	0.00
Heptane	0.210	40.00	0.08	0.00	0.00
Hydrocarbon Propellant	0.500	15.00	0.08	10.00	0.05
Toluene	0.320	20.00	0.06	0.00	0.00
Water	0.002			88	0.00
Surfactant	0.50			1	0.01
Inorganics	0.09			1	0.00
	SUM	100.00		100.00	

Total Cost, $/pound 0.39 0.06

% Cost Diff. Relative to Current Product -85.04

Total Cost, $/Unit 0.34 0.05

Recurring Costs C.E., $/lb VOC Reduced -0.50

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 14.00 ounce

High Cost

Category: Brake Cleaner
Subcategory: Aerosol

Typical noncomp: 75
Proposed Limit: 10

Average Unit Size 14.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Acetone	0.700	25.00	0.18	0.00	0.00
Carbon Dioxide	0.270	0.00	0.00	0.00	0.00
Heptane	0.290	40.00	0.12	0.00	0.00
Hydrocarbon Propellant	0.500	15.00	0.08	10.00	0.05
Toluene	0.320	20.00	0.06	0.00	0.00
Water	0.002			88	0.00
Surfactant	0.55			1	0.01
Inorganics	0.91			1	0.01
	SUM	100.00		100.00	

Total Cost, $/pound 0.43 0.07

% Cost Diff. Relative to Current Product -84.57

Total Cost, $/Unit 0.38 0.06

Recurring Costs C.E., $/lb VOC Reduced -0.56

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 14.00 ounce

1058

Low Cost

Category: Brake Cleaner
Subcategory: non-aerosol

Typical noncomp: 26
Proposed Limit: 10

Average Unit Size 106.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Toluene	0.320	15.00	0.05	0.00	0.00
Xylene	0.360	10.00	0.04	0.00	0.00
Ethyl Benzene	0.470	1.00	0.00	0.00	0.00
Acetone	0.650	74.00	0.48	0.00	0.00
Heptane	0.21		0.00	0.00	0.00
Water	0.002		0.00	98.00	0.00
Inorganics	0.09		0.00	1	0.00
Surfactant	0.50			1	0.01
	SUM	100.00		100.00	

Total Cost, $/pound 0.57 0.01

% Cost Diff. Relative to Current Product -98.62

Total Cost, $/Unit 3.77 0.05

Recurring Costs C.E., $/lb VOC Reduced -3.51

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 106.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Brake Cleaner
Subcategory: non-aerosol

Typical noncomp: 26
Proposed Limit: 10

Average Unit Size 106.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Toluene	0.320	15.00	0.05	0.00	0.00
Xylene	0.360	10.00	0.04	0.00	0.00
Ethyl Benzene	0.500	1.00	0.01	0.00	0.00
Acetone	0.700	74.00	0.52	0.00	0.00
Heptane	0.29	0.00	0.00	0.00	0.00
Water	0.002	0.00	0.00	98.00	0.00
Inorganics	0.91			1	0.01
Surfactant	0.55			1	0.01
	SUM	100.00		100.00	

Total Cost, $/pound 0.61 0.02

% Cost Diff. Relative to Current Product -97.27

Total Cost, $/Unit 4.02 0.11

Recurring Costs C.E., $/lb VOC Reduced -3.69

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 106.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

1059

Low Cost

Category: Automotive Windshield Washer Fluid
Subcategory: Liquid

Typical noncomp: 50
Proposed Limit: 25

Average Unit Size 126.90 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	49.00	0.00	74.00	0.00
Methanol	0.290		0.00	25.00	0.07
Inorganic	0.090	1.00	0.00	1.00	0.00
2-Butoxyethanol	1.040	2.00	0.02		0.00
Isopropyl Alcohol	0.600	48.00	0.29		0.00
	SUM	100.00		100.00	

Total Cost, $/pound	0.31	0.07
% Cost Diff. Relative to Current Product		-75.90
Total Cost, $/Unit	2.46	0.59
Recurring Costs C.E., $/lb VOC Reduced		-0.94

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 126.90 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Automotive Windshield Washer Fluid
Subcategory: Liquid

Typical noncomp: 50
Proposed Limit: 25

Average Unit Size 126.90 fl oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	49.00	0.00	74.00	0.00
Methanol	0.290	0.00	0.00	25.00	0.07
Inorganic	0.910	1.00	0.01	1.00	0.01
2-Butoxyethanol	1.090	2.00	0.02	0.00	0.00
Isopropyl Alcohol	0.650	48.00	0.31	0.00	0.00
	SUM	100.00		100.00	

Total Cost, $/pound	0.34	0.08
% Cost Diff. Relative to Current Product		-75.84
Total Cost, $/Unit	2.73	0.66
Recurring Costs C.E., $/lb VOC Reduced		-1.04

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 126.90 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

1060

Low Cost

Category: Carburator/Fuel-Injector Air Intake Cleaner
Subcategory: Aerosol

Typical noncomp: 65
Proposed Limit: 10

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Acetone	0.650	35.00	0.23	50.00	0.33
Carbon Dioxide	0.270		0.00	5.00	0.01
Methyl ester (Soy)	1.540		0.00	35.00	0.54
Methanol	0.290	20.00	0.06	10.00	0.03
Propane (HC Propellant)	0.500	15.00	0.08		0.00
Xylene	0.360	30	0.11		0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.47	0.91
% Cost Diff. Relative to Current Product		93.49
Total Cost, $/Unit	0.47	0.91
Recurring Costs C.E., $/lb VOC Reduced		0.80

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 16.00 ounce

High Cost

Category: Carburator/Fuel-Injector Air Intake Cleaner
Subcategory: Aerosol

Typical noncomp: 65
Proposed Limit: 10

Average Unit Size 16.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Acetone	0.700	35.00	0.25	50.00	0.35
Carbon Dioxide	0.270	0.00	0.00	5.00	0.01
Methyl ester (Soy)	1.540	0.00	0.00	35.00	0.54
Methanol	0.290	20.00	0.06	10.00	0.03
Propane (HC Propellant)	0.500	15.00	0.08	0.00	0.00
Xylene	0.360	30.00	0.11	0.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.49	0.93
% Cost Diff. Relative to Current Product		91.67
Total Cost, $/Unit	0.49	0.93
Recurring Costs C.E., $/lb VOC Reduced		0.81

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 16.00 ounce

1061

Low Cost

Category: Carburator/Fuel-Injector Air Intake Cleaner
Subcategory: non-aerosol

Typical noncomp: 60
Proposed Limit: 10

Average Unit Size 9.90 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Acetone	0.650	40.00	0.26	55.00	0.36
Methanol	0.290	25.00	0.07	10.00	0.03
Methyl ester (Soy)	1.540		0.00	35.00	0.54
Xylene	0.360	35.00	0.13		0.00
			0.00		0.00
			0.00		0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.46	0.93
% Cost Diff. Relative to Current Product		101.85
Total Cost, $/Unit	0.28	0.57
Recurring Costs C.E., $/lb VOC Reduced		0.93

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 9.90 ounce

High Cost

Category: Carburator/Fuel-Injector Air Intake Cleaner
Subcategory: non-aerosol

Typical noncomp: 60
Proposed Limit: 10

Average Unit Size 9.90 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Acetone	0.700	40.00	0.28	55.00	0.39
Methanol	0.290	25.00	0.07	10.00	0.03
Methyl ester (Soy)	1.540	0.00	0.00	35.00	0.54
Xylene	0.360	35.00	0.13	0.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.48	0.95
% Cost Diff. Relative to Current Product		99.16
Total Cost, $/Unit	0.30	0.59
Recurring Costs C.E., $/lb VOC Reduced		0.95

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 9.90 ounce

1062

Low Cost

Category: Engine Degreaser
Subcategory: Aerosol

Typical noncomp: 20
Proposed Limit: 10

Average Unit Size 14.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hydrocarbon Solvent (LVP)	0.86		0.00		0.00
Hydrocarbon Propellant	0.50	15.00	0.08	10.00	0.05
Inorganic	0.09	5.00	0.00	1.00	0.00
Water	0.002	75.00	0.00	88.00	0.00
2-Butoxyethanol	1.04	5	0.05		0.00
Surfactant	0.50			1	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	0.13	0.06
% Cost Diff. Relative to Current Product		-56.65
Total Cost, $/Unit	0.12	0.05
Recurring Costs C.E., $/lb VOC Reduced		-0.75

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 14.00 ounce

High Cost

Category: Engine Degreaser
Subcategory: Aerosol

Typical noncomp: 20
Proposed Limit: 10

Average Unit Size 14.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hydrocarbon Solvent (LVP)	0.96	0.00	0.00	0.00	0.00
Hydrocarbon Propellant	0.50	15.00	0.08	10.00	0.05
Inorganic	0.91	5.00	0.05	1.00	0.01
Water	0.002	75.00	0.00	88.00	0.00
2-Butoxyethanol	1.09	5.00	0.05	0.00	0.00
Surfactant	0.55			1.00	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	0.18	0.07
% Cost Diff. Relative to Current Product		-62.40
Total Cost, $/Unit	0.15	0.06
Recurring Costs C.E., $/lb VOC Reduced		-1.10

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 14.00 ounce

1063

Low Cost

Category: Bathroom and Tile
Subcategory: Non-aerosol

Typical noncomp: 4.8
Proposed Limit: 1

Average Unit Size 24.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
2-Butoxyethanol	1.040	2.50	0.03	1.00	0.01
fragrance	3.500	0.20	0.01	0.20	0.01
Water	0.002	80.20	0.00	95.00	0.00
Isopropyl alcohol	0.600	2.10	0.01	0.00	0.00
Inorganics	0.090	15.00	0.01	3.80	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.06	0.02
% Cost Diff. Relative to Current Product		-62.57
Total Cost, $/Unit	0.09	0.03
Recurring Costs C.E., $/lb VOC Reduced		-1.00

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 24.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Bathroom and Tile
Subcategory: Non-aerosol

Typical noncomp: 4.8
Proposed Limit: 1

Average Unit Size 24.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
2-Butoxyethanol	1.090	2.50	0.03	1.00	0.01
fragrance	7.000	0.20	0.01	0.20	0.01
Water	0.002	80.20	0.00	95.00	0.00
Isopropyl alcohol	0.650	2.10	0.01	0.00	0.00
Inorganics	0.910	15.00	0.14	3.80	0.03
SUM		100.00		100.00	

Total Cost, $/pound	0.19	0.06
% Cost Diff. Relative to Current Product		-68.20
Total Cost, $/Unit	0.29	0.09
Recurring Costs C.E., $/lb VOC Reduced		-3.46

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 24.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

1064

Low Cost

Category: Disinfectant
Subcategory: Aerosol

Typical noncomp: 89.6
Proposed Limit: 70

Average Unit Size 18.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.440	70.00	0.31	44.00	0.19
LVPs and Exempts	3.500		0.00	0.50	0.02
Hydrocarbon Propellant	0.500	19.60	0.10	22.00	0.11
Water	0.002	10.00	0.00	33.00	0.00
Phenol	0.620		0.00	0.30	0.00
Fragrance	3.500	0.2	0.01	0.20	0.01
Phenylphenol	3.500	0.2	0.01		
	SUM	100.00		100.00	

Total Cost, $/pound	0.42	0.33
% Cost Diff. Relative to Current Product		-21.32
Total Cost, $/Unit	0.47	0.37
Recurring Costs C.E., $/lb VOC Reduced		-0.46

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 18.00 ounce

High Cost

Category: Disinfectant
Subcategory: Aerosol

Typical noncomp: 89.6
Proposed Limit: 70

Average Unit Size 18.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.470	70.00	0.33	44.00	0.21
LVPs and Exempts	7.000	0.00	0.00	0.50	0.04
Hydrocarbon Propellant	0.500	19.60	0.10	22.00	0.11
Water	0.002	10.00	0.00	33.00	0.00
Phenol	0.620	0.00	0.00	0.30	0.00
Fragrance	7.000	0.20	0.01	0.20	0.01
Phenylphenol	7.000	0.20	0.01		
	SUM	100.00		100.00	

Total Cost, $/pound	0.46	0.37
% Cost Diff. Relative to Current Product		-19.09
Total Cost, $/Unit	0.51	0.41
Recurring Costs C.E., $/lb VOC Reduced		-0.44

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 18.00 ounce

1065

Low Cost

Category: Disinfectant
Subcategory: Liquid

Typical noncomp: 4.4
Proposed Limit: 1

Average Unit Size 133.20 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethylene glycol	0.440	5.00	0.02	0.00	0.00
Quaternary ammonia compounds	1.470	3.60	0.05	10.00	0.15
Water	0.002	57.10	0.00	90.00	0.00
Fragrance	3.500	0.30	0.01	0.00	0.00
Ethanol	0.44	4.30	0.02	0.00	0.00
Grouped LVP	0.70	29.70	0.21	0.00	0.00
	SUM	100.00		100.00	

Total Cost, $/pound	0.31	0.15
% Cost Diff. Relative to Current Product		-52.52
Total Cost, $/Unit	2.61	1.24
Recurring Costs C.E., $/lb VOC Reduced		-4.84

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 133.20 ounce
(3) Grouped LVP was the price range of propylene and triethylene glycol

High Cost

Category: Disinfectant
Subcategory: Liquid

Typical noncomp: 4.4
Proposed Limit: 1

Average Unit Size 133.20 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethylene glycol		5.00	0.00	0.00	0.00
Quaternary ammonia compounds	2.540	3.60	0.09	10.00	0.25
Water	0.002	57.10	0.00	90.00	0.00
Fragrance	7.000	0.30	0.02	0.00	0.00
Ethanol	0.47	4.30	0.02	0.00	0.00
Grouped LVP	1.00	29.70	0.30	0.00	0.00
	SUM	100.00		100.00	

Total Cost, $/pound	0.43	0.26
% Cost Diff. Relative to Current Product		-40.62
Total Cost, $/Unit	3.59	2.13
Recurring Costs C.E., $/lb VOC Reduced		-5.15

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 133.20 ounce
(3) Grouped LVP was the price range of propylene and triethylene glycol

1066

Low Cost

Category: Floor Polish or Wax (for flexible and non-resilient floors)
Subcategory: Non-aerosol

Typical noncomp: 7
Proposed Limit: 1

Average Unit Size 688.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	63.00	0.00	67.00	0.00
Dipropylene Glycol monomethyl ether	1.34	7.00	0.09	1.00	0.01
Diethylene glycol monoethyl ether	1.23	5.00	0.06	7.00	0.09
Tributoxy ethyl phosphate	1.75	2.00	0.04	2.00	0.04
Exempts and non-solvent LVP VOC	3.50	23.00	0.81	23.00	0.81
SUM		100.00		100.00	

Total Cost, $/pound	1.00	0.94
% Cost Diff. Relative to Current Product		-5.59
Total Cost, $/Unit	42.85	40.46
Recurring Costs C.E., $/lb VOC Reduced		-0.93

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 688.00 ounce

High Cost

Category: Floor Polish or Wax (for flexible and non-resilient floors)
Subcategory: Non-aerosol

Typical noncomp: 7
Proposed Limit: 1

Average Unit Size 688.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	63.00	0.00	67.00	0.00
Dipropylene Glycol monomethyl ether	1.76	7.00	0.12	1.00	0.02
Diethylene glycol monoethyl ether	1.30	5.00	0.07	7.00	0.09
Tributoxy ethyl phosphate	2.02	2.00	0.04	2.00	0.04
Exempts and non-solvent LVP VOC	7.00	23.00	1.61	23.00	1.61
SUM		100.00		100.00	

Total Cost, $/pound	1.84	1.76
% Cost Diff. Relative to Current Product		-4.32
Total Cost, $/Unit	79.11	75.69
Recurring Costs C.E., $/lb VOC Reduced		-1.33

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 688.00 ounce

1067

Low Cost

Category: Furniture Maintenance Product
Subcategory: Non-aerosol

Typical noncomp: 8
Proposed Limit: 3

Average Unit Size 120.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Mineral Spirits	0.95	7.00	0.07	0.00	0.00
Hydrocarbon Solvent (LVP)	0.86	7.00	0.06	20.00	0.17
Water	0.002	70.00	0.00	65.00	0.00
Fragrance	3.50	1.00	0.04	1.00	0.04
Inorganics	0.09	10.00	0.01	14.00	0.01
Grouped LVP	0.76	5	0.04	0.00	0.00
	SUM	100.00		100.00	

Total Cost, $/pound: 0.21 | 0.22

% Cost Diff. Relative to Current Product: 5.14

Total Cost, $/Unit: 1.58 | 1.66

Recurring Costs C.E., $/lb VOC Reduced: 0.22

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 120.00 ounce
(3) Grouped LVP cost assumed to mineral oil
(4) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Furniture Maintenance Product
Subcategory: Non-aerosol

Typical noncomp: 8
Proposed Limit: 3

Average Unit Size 120.00 fl oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Mineral Spirits	1.06	7.00	0.07	0.00	0.00
Hydrocarbon Solvent (LVP)	0.96	7.00	0.07	20.00	0.19
Water	0.002	70.00	0.00	65.00	0.00
Fragrance	7.00	1.00	0.07	1.00	0.07
Inorganics	0.91	10.00	0.09	14.00	0.13
Grouped LVP	0.96	5.00	0.05	0.00	0.00
	SUM	100.00		100.00	

Total Cost, $/pound: 0.35 | 0.39

% Cost Diff. Relative to Current Product: 11.06

Total Cost, $/Unit: 2.64 | 2.93

Recurring Costs C.E., $/lb VOC Reduced: 0.78

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 120.00 ounce
(3) Grouped LVP cost assumed to mineral oil
(4) Cost of "inorganics" is the range of the most common inorganics in category

1068

Low Cost

Category: General Purpose Cleaner
Subcategory: Aerosol

Typical noncomp: 10
Proposed Limit: 8

Average Unit Size 18.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
2-Butoxyethanol	1.04	2.30	0.02	2.00	0.02
Isopropyl alcohol	0.60	1.60	0.01		0.00
Propane	0.48	0.80	0.00	0.80	0.00
n-Butane	0.46	5.20	0.02		0.00
Isobutane	0.51		0.00	5.20	0.03
Water	0.002	90	0.00	90.00	0.00
Fragrance	3.50	0.1	0.00	0.2	0.01
Inorganics	0.09			1.8	0.00
	SUM	100.00		100.00	

Total Cost, $/pound	0.07	0.06
% Cost Diff. Relative to Current Product		-7.51
Total Cost, $/Unit	0.07	0.07
Recurring Costs C.E., $/lb VOC Reduced		-0.25

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 18.00 ounce

High Cost

Category: General Purpose Cleaner
Subcategory: Aerosol

Typical noncomp: 10
Proposed Limit: 8

Average Unit Size 18.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
2-Butoxyethanol	1.09	2.30	0.03	2.00	0.02
Isopropyl alcohol	0.65	1.60	0.01	0.00	0.00
Propane	0.48	0.80	0.00	0.80	0.00
n-Butane	0.46	5.20	0.02	0.00	0.00
Isobutane	0.51	0.00	0.00	5.20	0.03
Water	0.002	90.00	0.00	90.00	0.00
Fragrance	7.00	0.10	0.01	0.20	0.01
Inorganics	0.91			1.80	0.02
	SUM	100.00		100.00	

Total Cost, $/pound	0.07	0.08
% Cost Diff. Relative to Current Product		17.09
Total Cost, $/Unit	0.08	0.09
Recurring Costs C.E., $/lb VOC Reduced		0.62

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 18.00 ounce

1069

Low Cost

Category: General Purpose Degreaser
Subcategory: Aerosol

Typical noncomp: 50 Average Unit Size 19.00 wt oz
Proposed Limit: 10

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Acetone	0.65	3.00	0.02	25.00	0.16
d'Limonene	1.20	32.00	0.38	7.00	0.08
2-Butoxyethanol	1.04		0.00	3.00	0.03
Carbon Dioxide	0.27		0.00	3.50	0.01
LVP Hydrocarbon	0.86		0.00	55.00	0.47
Dipropylene glycol mono butyl ether	1.67	14	0.23	6.50	0.11
Water	0.002	33	0.00		0.00
Propane	0.48	10	0.05		0.00
Iso-butane	0.51	8	0.04		0.00
	SUM	100.00		100.00	

Total Cost, $/pound 0.73 0.87

% Cost Diff. Relative to Current Product 19.53

Total Cost, $/Unit 0.86 1.03

Recurring Costs C.E., $/lb VOC Reduced 0.35

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 19.00 ounce

High Cost

Category: General Purpose Degreaser
Subcategory: Aerosol

Typical noncomp: 50 Average Unit Size 19.00 wt oz
Proposed Limit: 10

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Acetone	0.70	3.00	0.02	25.00	0.18
d'Limonene	1.30	32.00	0.42	7.00	0.09
2-Butoxyethanol	1.09	0.00	0.00	3.00	0.03
Carbon Dioxide	0.27	0.00	0.00	3.50	0.01
LVP Hydrocarbon	0.96	0.00	0.00	55.00	0.53
Dipropylene glycol mono butyl ether	1.77	14.00	0.25	6.50	0.12
Water	0.002	33.00	0.00	0.00	0.00
Propane	0.48	10.00	0.05	0.00	0.00
Iso-butane	0.51	8.00	0.04	0.00	0.00
	SUM	100.00		100.00	

Total Cost, $/pound 0.77 0.95

% Cost Diff. Relative to Current Product 22.85

Total Cost, $/Unit 0.92 1.13

Recurring Costs C.E., $/lb VOC Reduced 0.44

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 19.00 ounce

1070

Low Cost

Category: Laundry Starch Product/Sizing/ Fabric Finish
Subcategory: Aerosol

Typical noncomp: 5
Proposed Limit: 4.5

Average Unit Size 22.00 Wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hydrocarbon Propellant	0.50	5.00	0.03	4.50	0.02
non-solvent LVP	3.50	3.00	0.11	3.00	0.11
Water	0.002	91.40	0.00	91.90	0.00
Fragrance	3.50	0.10	0.00	0.10	0.00
Inorganics	0.09	0.50	0.00	0.50	0.00
			0.00	0.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.14	0.13
% Cost Diff. Relative to Current Product		-1.83
Total Cost, $/Unit	0.19	0.18
Recurring Costs C.E., $/lb VOC Reduced		-0.50

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 22.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Laundry Starch Product/Sizing/ Fabric Finish
Subcategory: Aerosol

Typical noncomp: 5
Proposed Limit: 4.5

Average Unit Size 22.00 fl oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Hydrocarbon Propellant	0.50	5.00	0.03	4.50	0.02
non-solvent LVP	7.00	3.00	0.21	3.00	0.21
Water	0.002	91.40	0.00	91.90	0.00
Fragrance	7.00	0.10	0.01	0.10	0.01
Inorganics	0.91	0.50	0.00	0.50	0.00
0		0.00		0.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.25	0.25
% Cost Diff. Relative to Current Product		-1.00
Total Cost, $/Unit	0.34	0.34
Recurring Costs C.E., $/lb VOC Reduced		-0.50

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 22.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

1071

Low Cost

Category: Oven Cleaner
Subcategory: Non-aerosol

Typical noncomp: 5
Proposed Limit: 1

Average Unit Size 144.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	65.00	0.00	69.00	0.00
Sodium hydroxide	0.140	10.00	0.01	10.00	0.01
Potassium hydroxide	0.400	20.00	0.08	20.00	0.08
Monoethanolamine	1.220	2.00	0.02	1.00	0.01
2-Butoxyethanol	1.040	3.00	0.03	0.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.15	0.11
% Cost Diff. Relative to Current Product		-28.71
Total Cost, $/Unit	1.36	0.97
Recurring Costs C.E., $/lb VOC Reduced		-1.08

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 144.00 ounce

High Cost

Category: Oven Cleaner
Subcategory: Non-aerosol

Typical noncomp: 5
Proposed Limit: 1

Average Unit Size 144.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Water	0.002	65.00	0.00	69.00	0.00
Sodium hydroxide	0.160	10.00	0.02	10.00	0.02
Potassium hydroxide	0.480	20.00	0.10	20.00	0.10
Monoethanolamine	1.320	2.00	0.03	1.00	0.01
2-Butoxyethanol	1.090	3.00	0.03	0.00	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.17	0.13
% Cost Diff. Relative to Current Product		-26.58
Total Cost, $/Unit	1.55	1.14
Recurring Costs C.E., $/lb VOC Reduced		-1.15

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 144.00 ounce

1072

Low Cost

Category: Sanitizer
Subcategory: Aerosol

Typical noncomp: 94
Proposed Limit: 70

Average Unit Size 10.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.440	40.90	0.18	40.00	0.18
Triethylene/ Propylene glycol	0.700	6.00	0.04	4.00	0.03
Hydrocarbon Propellant	0.500	53.00	0.27	30.00	0.15
HFC152a	1.770	10.00	0.18	0.00	0.00
Fragrance	3.500	0.10	0.00	0.10	0.00
Water	0.002			25.90	0.00
	SUM	110.00		100.00	

Total Cost, $/pound	0.67	0.36
% Cost Diff. Relative to Current Product		-46.36
Total Cost, $/Unit	0.42	0.22
Recurring Costs C.E., $/lb VOC Reduced		-1.29

Assume: (1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 10.00 ounce

High Cost

Category: Sanitizer
Subcategory: Aerosol

Typical noncomp: 94
Proposed Limit: 70

Average Unit Size 10.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.470	40.90	0.19	40.00	0.19
Triethylene/ Propylene glycol	1.000	6.00	0.06	4.00	0.04
Hydrocarbon Propellant	0.500	53.00	0.27	30.00	0.15
HFC152a	1.770	10.00	0.18	0.00	0.00
Fragrance	7.000	0.10	0.01	0.10	0.01
Water	0.002			25.90	0.00
	SUM	110.00		100.00	

Total Cost, $/pound	0.70	0.39
% Cost Diff. Relative to Current Product		-45.02
Total Cost, $/Unit	0.44	0.24
Recurring Costs C.E., $/lb VOC Reduced		-1.32

Assume: (1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 10.00 ounce

1073

Low Cost

Category: Sanitizer
Subcategory: Liquid

Typical noncomp: 4.4
Proposed Limit: 1

Average Unit Size 133.20 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.440	1.20	0.01	0.00	0.00
Quaternary ammonia compounds	1.470	10.00	0.15	0.10	0.00
Water	0.002	88.80	0.00	99.90	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.15	0.00
% Cost Diff. Relative to Current Product		-97.75
Total Cost, $/Unit	1.28	0.03
Recurring Costs C.E., $/lb VOC Reduced		-4.43

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 133.20 ounce

High Cost

Category: Sanitizer
Subcategory: Liquid

Typical noncomp: 4.4
Proposed Limit: 1

Average Unit Size 133.20 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.470	1.20	0.01	0.00	0.00
Quaternary ammonia compounds	2.540	10.00	0.25	0.10	0.00
Water	0.002	88.80	0.00	99.90	0.00
SUM		100.00		100.00	

Total Cost, $/pound	0.26	0.00
% Cost Diff. Relative to Current Product		-98.26
Total Cost, $/Unit	2.18	0.04
Recurring Costs C.E., $/lb VOC Reduced		-7.56

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 133.20 ounce

1074

Low Cost

Category: Temporary Hair Color
Subcategory: Aerosol

Typical noncomp: 90
Proposed Limit: 55

Average Unit Size 3.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.440	15.00	0.07	19.00	0.08
Dimethyl Ether	0.950	75.00	0.71	35.00	0.33
Aminomethyl propanol	2.610		0.00	0.80	0.02
Fragrance	3.500		0.00	0.20	0.01
Water	0.002		0.00	30.00	0.00
Inorganics	0.090	5	0.00	5.00	0.00
Resin	3.500	5	0.18	8	0.28
Acetone	0.650			2	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	0.96	0.74
% Cost Diff. Relative to Current Product		-22.54
Total Cost, $/Unit	0.18	0.14
Recurring Costs C.E., $/lb VOC Reduced		-0.62

Assume:
(1) Cost of "All Others" remains at $ 3.50 per pound
(2) Average unit size = 3.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

High Cost

Category: Temporary Hair Color
Subcategory: Aerosol

Typical noncomp: 90
Proposed Limit: 55

Average Unit Size 3.00 wt oz

Formulation and Cost Comparison

Component (A)	Unit Cost $/lb (B)	Typical Non-compliant wt% (C)	Typical Non-compliant Cost (B)x(C)/100	% VOC Compliant wt% (D)	% VOC Compliant Cost (B)x(D)/100
Ethanol	0.470	15.00	0.07	19.00	0.09
Dimethyl Ether	0.950	75.00	0.71	35.00	0.33
Aminomethyl propanol	2.610	0.00	0.00	0.80	0.02
Fragrance	7.000	0.00	0.00	0.20	0.01
Water	0.002	0.00	0.00	30.00	0.00
Inorganics	0.910	5.00	0.05	5.00	0.05
Resin	7.000	5.00	0.35	8.00	0.56
Acetone	0.700	0.00	0.00	2.00	0.01
	SUM	100.00		100.00	

Total Cost, $/pound	1.18	1.08
% Cost Diff. Relative to Current Product		-8.63
Total Cost, $/Unit	0.22	0.20
Recurring Costs C.E., $/lb VOC Reduced		-0.29

Assume:
(1) Cost of "All Others" remains at $ 7.00 per pound
(2) Average unit size = 3.00 ounce
(3) Cost of "inorganics" is the range of the most common inorganics in category

APPENDIX G:
Lawsuit Settlement Agreement

June 25, 2003 Final

SECOND AMENDMENT TO SETTLEMENT AGREEMENT

The Natural Resources Defense Council, Inc. ("NRDC"), Coalition for Clean Air ("CCA"), and Communities for a Better Environment ("CBE") (collectively, "Plaintiffs") and Catherine Witherspoon, Executive Officer of the California Air Resources Board, Alan C. Lloyd, Ph.D., Joseph C. Calhoun, Dorene D'Adamo, Mark J. DeSaulnier, C. Hugh Friedman, William F. Friedman, M.D., Mathew R. McKinnon, Barbara Patrick, Barbara Riordan, William A. Burke, and Ron Roberts, Members of the Air Resources Board, in their official capacities (collectively "the Air Resources Board" or "ARB") hereby amend the Settlement Agreement ("Plaintiffs-ARB Settlement Agreement") entered into between them in January, 1999. This amendment, consisting of eight pages, will be referred to hereinafter as the "Second Amendment to Settlement Agreement." Plaintiffs and the Air Resources Board are hereinafter referred to individually as "Party" or collectively as "Parties."

This Second Amendment to Settlement Agreement is made for the following reasons. Section 2(a) of the Plaintiffs-ARB Settlement Agreement requires, among other things, that by December 31, 2001, the ARB shall adopt and implement measures that will achieve emission reductions of 16 tons per day ("tpd") of reactive organic gases (ROG) in the South Coast Air Basin (SCAB) in 2010. Section 3(a) of the Plaintiffs-ARB Settlement Agreement further provides in part that if the ARB staff concludes it is technologically infeasible to achieve some or all of these 16 tpd of ROG emission reductions as set forth in section 2(a), then the ARB staff will, no later than July 1, 2001, provide written notice to Plaintiffs of this conclusion. Pursuant

to section 3(a) of the Plaintiffs-ARB Settlement Agreement, on June 29, 2001, ARB Executive Officer Michael P. Kenny sent to Plaintiffs a letter providing notice that staff had concluded it is technologically infeasible to adopt measures to achieve all of the required 16 tpd in ROG reductions by December 31, 2001. Since that time the Parties have engaged in discussions over a substitute schedule for rule adoption and implementation. ARB has proposed a new adoption and implementation schedule that it believes is technologically feasible to achieve. While Plaintiffs by this Second Amendment do not express a position on whether it was technologically infeasible to adopt measures to achieve all of the required 16 tpd in ROG reductions by December 31, 2001, they accept ARB's representations that the substitute schedule in this Second Amendment is now feasible, believe that this amendment to the Plaintiffs-ARB Settlement Agreement will have significant emissions benefits from new measures to be proposed for adoption, and is therefore in the interest of the public.

The Parties have met and conferred, and desire to enter into this Second Amendment to Settlement Agreement in order to resolve the remaining obligations of ARB under section 2 of the Plaintiffs-ARB Settlement Agreement. Of the 16 tpd of ROG required to be achieved from measures adopted by December 31, 2001, the ARB has achieved 5 tpd of ROG from measures already adopted, but has not yet achieved the remaining 11 tpd of ROG. With the exception of these 11 tpd of ROG, the Parties acknowledge that the ARB has fulfilled the obligations specified in section 2 of the Plaintiffs-ARB Settlement Agreement to adopt measures that will achieve 12 tpd of ROG from measures adopted by December 31, 1999, and 14 tpd of ROG and 2 tons of NOx from measures adopted by December 31, 2000.

This Second Amendment shall replace sections 1(a), 2(a) through (e) and 3(a) of the Plaintiffs-ARB Settlement Agreement, as modified by the First Amendment to Settlement

Agreement. The Plaintiffs-ARB Settlement Agreement as amended herein, and the First Amendment to Settlement Agreement entered into in December 1999, in all other respects shall remain in full force and effect, and the additional obligations of ARB established by Sections 1, 2, and 4 below shall be enforced pursuant to and otherwise subject to the terms of the Plaintiffs-ARB Settlement Agreement and the First Amendment to Settlement Agreement

WHEREFORE, the Parties hereto agree as follows:

1. The ARB staff shall submit to the Board and propose for adoption the control measures set forth in Attachment A to this Second Amendment to Settlement Agreement, with implementation proposed for such control measures on or before the implementation dates set forth in Attachment A. The ARB Board shall take action thereon on or before the adoption dates set forth in Attachment A. Such action by the Board may include any action within its discretion. Once adopted, each control measure adopted pursuant to this Second Amendment to Settlement Agreement shall be implemented by the ARB Defendants on the schedule in the adopted measure.

2. (a) Except as provided in section 3 below, ARB shall adopt and implement measures that will achieve at least the following aggregate emission reductions for ROG in tons per day ("tpd") in the SCAB in 2010, as set forth in the following schedule. For purposes of this schedule, "on-baseline" ROG refers to reducing only those ROG emissions that are included in the 1994 State Implementation Plan (SIP) emission inventory. "Total" ROG refers to reducing both on-baseline and off-baseline ROG emissions (i.e., those ROG emissions that were not included in the 1994 SIP emission inventory, but have since been identified and quantified).

Minimum Commitments for Total Emission Reductions
(South Coast Air Basin 2010 (tons per day)

ADOPTION DATE	On-baseline ROG	Total ROG[1]
December 31, 2003	1	6
December 31, 2004	2	2
December 31, 2005	7	8
December 31, 2006	1	1
Total	11	17

IMPLEMENTATION DATE*	On-baseline ROG	Total ROG	NOx
January 1, 2003	5	5	-
January 1, 2004	10	10	2
January 1, 2005	10	10	-
January 1, 2006	8	13	-
January 1, 2007	2	3	
January 1, 2008	6	6	
Total	41	47	2

*This table only includes remaining adoption commitments and future implementation dates. The January 1999 Settlement Agreement includes a January 1, 2001 implementation target of 1 tpd on-baseline ROG and 16 tpd total ROG which has been met.

(b) "On-baseline ROG" emission reductions will count toward the minimum commitments in this section 2 only to the extent that they reduce emissions in the baseline inventory in the 1994 SIP.

(c) Emission reductions in excess of the minimum emissions reductions commitment for a given year may be applied to the emissions reduction commitment of subsequent years.

(d) ARB may meet the obligation set forth in this section 2 by adopting one or more of the control measures listed in Attachment A, or by adopting one or more alternative control

measures, so long as the aggregate emission reductions therefrom comply with the schedule set forth in this section 2.

(e) The Parties agree that the minimum commitments for emission reductions were determined by comparing reductions of 1994 SIP inventory emissions resulting from control measures adopted or implemented by ARB to date since adoption of the 1994 SIP to the emission reduction commitments contained in the 1994 SIP. The Parties may, by mutual agreement, adjust the minimum commitments for total emission reductions set forth in this section 2 to reflect additional emission reductions achieved by control measures previously adopted or implemented by the ARB that are not reflected in Attachment A and that are not otherwise required by or assumed in the 1994 SIP or for any other purpose.

3. Arbitration

(a) In the event the ARB staff concludes it is technologically infeasible to achieve some or all of the emission reductions set forth in section 2 of this Second Amendment to Settlement Agreement as a minimum commitment for any of the specified adoption dates, either by adoption of one or more control measures on or before the specified adoption dates or, alternatively, by implementation of one or more control measures on or before the specified implementation dates, ARB staff will, no later than six months prior to the specified adoption date, provide written notice to the Plaintiffs of this conclusion including the analysis and documentation upon which staff relies for this conclusion. The notice shall also include a statement of ARB staff's conclusion as to whether the specified emission reductions will remain technologically infeasible to achieve by the year 2010, or, alternatively, whether there is an earlier date when achievement of the specified emission reductions will be technologically feasible and, if so, what that date is. For purposes of this Arbitration provision of the Second Amendment to Settlement Agreement,

Sections (3)(b) through (3)(d) of the Plaintiffs-ARB Settlement Agreement are hereby incorporated by reference, as though fully set forth herein, provided however that where the term "December 31, 2001" appears in the Plaintiffs-ARB Settlement Agreement, it shall be replaced by the term "the specified adoption date" in this Arbitration provision of this Second Amendment to Settlement Agreement, and where the term "for 2001" appears, it shall be replaced by the term "for the specified year."

This Second Amendment shall add the following provisions to the Plaintiffs-ARB Settlement Agreement:

4. The ARB staff shall take the following actions:

(a) Consumer products labeling program

ARB staff will evaluate the feasibility of developing an environmental labeling program that would address the air quality impacts of consumer products. As currently envisioned, such a program would focus on products that are "ultra-low emitting" and "zero emitting" for both volatile organic compounds and toxic air contaminants. ARB staff will complete the evaluation by January 2004. If the program is determined to be feasible, staff will develop a proposal and present it to the Board by December 31, 2004, with proposed implementation within one year after Board approval.

In addition, ARB staff will evaluate the feasibility of establishing a multi-media environmental labeling program for consumer products in cooperation with other Cal/EPA Boards and Departments. If the multi-media program is feasible and supported by other Cal/EPA

Boards and Departments, the program will be proposed for adoption within a timeframe established jointly by all participating Boards and Departments.

(b) Light-duty motor vehicle retrofit program

ARB staff is conducting a Pilot Program to evaluate the potential for reducing in-use exhaust and evaporative ROG and NOx emissions from light-duty vehicles. The Program would achieve emission reductions by (1) repairing vehicles that pass Smog Check but exceed their original certification standards, or (2) for vehicles that fail Smog Check, repairing them beyond the point necessary to pass the Smog Check inspection. The Pilot Program will consist of extensive vehicle testing during which ARB staff will evaluate the benefits associated with replacing or repairing emission-related parts/problems including: catalysts, carbon canisters and corresponding fuel lines, fuel leaks, and oxygen sensors. ARB staff will then determine which technologies provide maximum benefits and in what situations emission reductions can be achieved.

The Pilot Program started in 2002, and testing will be completed by December 31, 2003. By December 31, 2004, ARB staff will complete an evaluation of the information collected during the Pilot program to determine the emissions benefits and estimated costs of implementing one or more light-duty vehicle retrofit (repair) programs, including the incorporation of such program(s) into the current Smog Check program. If, based on this evaluation, staff determines that a repair program(s) is an effective means of reducing emissions from in-use light-duty vehicles, staff will submit a proposed rule to implement a light-duty vehicle retrofit (repair) program to the Board in 2005, and the Board shall consider and take action thereon in 2005.

In determining whether a retrofit (repair) program(s) is effective, the program shall be considered effective if:

- repairs/retrofits made with available parts are durable and effective at reducing emissions;
- repairs/retrofits are compatible with vehicles' existing emission control systems and do not negatively affect vehicle operation;
- the population of repairable vehicles and the anticipated capture rate are sufficient to ensure a successful program; and
- the program is cost-effective. In evaluating the cost-effectiveness, ARB staff will consider the fact that the costs of the program may be borne directly by individual consumers. ARB staff will also consider the cost of repairs relative to the value of the vehicle.

5. Each of the Parties represents and warrants that the person executing this Second Amendment to Settlement Agreement on its behalf is a representative duly authorized to bind it and empowered to enter into this Second Amendment to Settlement Agreement on its behalf. The Executive Officer of the ARB warrants that he has authority to execute this Second Amendment to Settlement Agreement on behalf of the Air Resources Board. Execution of this Agreement by the Executive Officer shall bind the Air Resources Board and successors thereto to the commitments set forth in this Agreement. It is understood that Plaintiffs' remedies under this Second Amendment to Settlement Agreement may be pursued only against the Air Resources Board and their successors.

THE UNDERSIGNED ACKNOWLEDGE THAT THEY HAVE READ THIS AGREEMENT IN ITS ENTIRETY AND FULLY UNDERSTAND ITS TERMS.

Dated: July _____, 2003

COALITION FOR CLEAN AIR

BY: _____
Tim Carmichael
Executive Director

Dated: July _____, 2003

NATURAL RESOURCES DEFENSE COUNCIL, INC.

BY: _____
Gail Ruderman Feuer
Staff Attorney

Dated: July _____, 2003

COMMUNITIES FOR A BETTER ENVIRONMENT

BY: _____
Carlos Porras
Executive Director

Dated: July 1, 2003

THE AIR RESOURCES BOARD

BY: _____
Catherine Witherspoon
Executive Officer, Air Resources Board

APPROVED AS TO FORM:

Dated: July _____, 2003

_____
Gail Ruderman Feuer
Attorney for Plaintiffs Natural Resources Defense Council, Inc. and Coalition for Clean Air

Dated: July _____, 2003

_____
Roger Beers
Attorney for Plaintiff Communities for a Better Environment

Dated: July _____, 2003

_____
Scott Kuhn
Attorney for Plaintiff Communities for a Better Environment

Dated: July 1, 2003

_____
Kathleen Walsh
General Counsel, Air Resources Board, and Attorney for the Air Resources Board

Dated: July 1, 2003

COALITION FOR CLEAN AIR

BY: Tim Carmichael

Tim Carmichael
Executive Director

Dated: July 1, 2003

NATURAL RESOURCES DEFENSE COUNCIL, INC.

BY: Gail Ruderman Feuer

Gail Ruderman Feuer
Staff Attorney

Dated: July ____, 2003

COMMUNITIES FOR A BETTER ENVIRONMENT

BY: _____

Carlos Porras
Executive Director

Dated: July ____, 2003

THE AIR RESOURCES BOARD

BY: _____

Catherine Witherspoon
Executive Officer, Air Resources Board

APPROVED AS TO FORM:

Dated: July 1, 2003

Gail Ruderman Feuer

Gail Ruderman Feuer
Attorney for Plaintiffs Natural Resources Defense Council, Inc. and Coalition for Clean Air

Dated: July ____, 2003

_____

Roger Beers
Attorney for Plaintiff Communities for a Better Environment

Dated: July ____, 2003

_____

Scott Kuhn
Attorney for Plaintiff Communities for a Better Environment

Dated: July ____, 2003

_____

Kathleen Walsh
General Counsel, Air Resources Board, and Attorney for the Air Resources Board

Dated: July ____, 2003

COALITION FOR CLEAN AIR

BY: _____
Tim Carmichael
Executive Director

Dated: July ____, 2003

NATURAL RESOURCES DEFENSE COUNCIL, INC.

BY: _____
Gail Ruderman Feuer
Staff Attorney

Dated: July 1, 2003

COMMUNITIES FOR A BETTER ENVIRONMENT

BY: _____
Carlos Porras
Executive Director

Dated: July ____, 2003

THE AIR RESOURCES BOARD

BY: _____
Catherine Witherspoon
Executive Officer, Air Resources Board

APPROVED AS TO FORM:

Dated: July ____, 2003

_____
Gail Ruderman Feuer
Attorney for Plaintiffs Natural Resources Defense Council, Inc. and Coalition for Clean Air

Dated: July ____, 2003

_____
Roger Beers
Attorney for Plaintiff Communities for a Better Environment

Dated: July 1, 2003

_____
Scott Kuhn
Attorney for Plaintiff Communities for a Better Environment

Dated: July ____, 2003

_____
Kathleen Walsh
General Counsel, Air Resources Board, and Attorney for the Air Resources Board

PROPOSED AMENDMENT TO SIP LAWSUIT SETTLEMENT AGREEMENTS
ATTACHMENT A – Measures to be considered by ARB

Adoption Date	Measure	Implementation Period	Emission Reductions South Coast Air Basin 2010			
			On-Baseline ROG[1] (1994 SIP)	ROG[1] (current inventory)	NOx[1] (current inventory)	PM[1] (current inventory)
By Dec 31, 2003	Evaporative and exhaust emission standards for small off-road engines	2006	0.5	5-6	0.8-2	0
	Particulate/ROG retrofits: trash trucks	2004-2010	<0.5	<0.5	0	<0.5
	fuel tanker trucks	2005-2010	<0.5	<0.5	0	<0.5
	TRUs	2005-2010	<0.5	<0.5	NQ	<0.5
	stationary engines	2005-2010	<1	<1	0	<1
	Enhanced vapor recovery for aboveground tanks	2007	<0.1	<0.1	0	0
	Heavy-duty gas truck standards (align w/ U.S. EPA)	2008	<0.5	<0.5	0-0.5	NQ
	Low sulfur diesel fuel for on- and off-road engines	2006	Enables retrofits		Enables retrofits	
	On-board diagnostics for diesel trucks	2007			NQ	NQ
	Idling controls for new diesel trucks	2007			NQ	NQ
	Complete light-duty pilot program testing	-	-	-	-	-
By Jun 30, 2004	Next phase of consumer products standards	2006	2	2	0	0
By Dec 31, 2004	Particulate/ROG retrofits: on-road public fleets	2005-2010	<0.5	<0.5	0	<0.1
	off-road public fleets	2005-2010	<0.5	<0.5	0	<0.5
	Tier IV emission standards for off-road diesel engines	2008-2014	NQ	NQ	NQ	NQ
	Gasoline dispenser hose permeation standards	2007	0	0-1	0	0
By Dec 31, 2005	***Additional standards for consumer products***	***2008***	***4-8***	***4-8***	***0***	***0***
	Retrofits for existing off-road gasoline equipment	***2006-2012***	***1-4***	***0.5-1.4***	***1.5-3.5***	***NQ***
	Vapor recovery for cargo tankers	2007	0	2	0	0
	Particulate/ROG retrofits: on-road private fleets	2007-2010	1	1	0	0-1
	Additional emission standards for large gasoline/ LPG off-road engines (align w/ U.S. EPA)	2007	0	0	0.8	0
By Dec 31, 2006	Particulate/ROG retrofits: off-road private fleets	2007- 2010	1	1	0	1
	TOTAL ROG ADOPTION COMMITMENT		**11**	**17**		

[1] This table lists the measures the ARB intends to pursue to achieve the emission reduction commitments specified in the Second Amendment to Settlement Agreement. The potential emission reductions from *each* measure are shown for informational purposes only. The ARB does not commit to achieve any specific quantity of emission reductions from any particular measure.

Bold and italicized measures have been added since November 2002 version of proposal.