California Environmental Protection Agency

Air Resources Board

PUBLIC MEETING AGENDA

Thursday, January 24, 2013 (Bakersfield, CA) and Friday, January 25, 2013 (Diamond Bar, CA)

JANUARY 24, 2013, LOCATION:
Kern County Board of Supervisors
Board Chambers, First Floor
1115 Truxtun Avenue
Bakersfield, CA 93301

This facility is accessible by public transit. For transit information, call: (800) 560-1733, http://roads.kerndsa.com/bus-services (This facility is accessible to persons with disabilities.)

JANUARY 25, 2013, LOCATION:
South Coast Air Quality Management District
Auditorium
21865 E. Copley Drive
Diamond Bar, California 91765-4182

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

January 24, 2013
9:00 a.m.

Kern County Board of Supervisors
Board Chambers, First Floor
1115 Truxtun Avenue
Bakersfield, CA 93301

(Spanish translation services will be provided at the January 24th Board Meeting.)

CONSENT CALENDAR:

The following item(s) on the consent calendar will be voted on by the Board immediately after the start of the public meeting, unless removed from the consent calendar either upon a Board member's request or if someone in the audience wishes to speak on it.

Consent Item #

13-1-3: Public Meeting to Consider Appointment of a New Member to the Research Screening Committee

Staff will recommend the appointment of Dr. Alan Vette to fill the vacancy left by the resignation of Dr. Dan Costa of U.S. EPA. The Board's Research Screening Committee consists of scientists, engineers, and others who are knowledgeable, technically qualified, and experienced in air pollution research. Dr. Vette is the Assistant Director for Air, Climate and Energy research at the U.S. EPA's National Health and Environmental Effects Research Laboratory.

DISCUSSION ITEMS:

Note: The following agenda items may be heard in a different order at the Board meeting.

Agenda Item #

13-1-1: Public Meeting to Hear an Overview of PM2.5 Science and Research and to Consider Approving the San Joaquin Valley PM2.5 State Implementation Plan

Staff will present an overview of the latest PM2.5 air quality science and on-going research which supported the development of the San Joaquin Valley 2012 PM2.5 State Implementation Plan (2012 PM2.5 Plan). The Board will then consider approving the 2012 PM2.5 Plan as a revision to the California State Implementation Plan. The 2012 PM2.5 Plan demonstrates the San Joaquin Valley will attain the federal 24-hour PM2.5 standard (adopted in 2006) by 2019.

13-1-2: Public Meeting to Brief the Board on the Status of SB 375 in San Joaquin Valley

Staff will brief the Board on the status of SB 375 planning in the San Joaquin Valley.

January 25, 2013

9:00 a.m.

South Coast Air Quality Management District, Auditorium
21865 E. Copley Drive
Diamond Bar, California 91765-4182

DISCUSSION ITEMS:

Note: The following agenda items may be heard in a different order at the Board meeting.

Agenda Item #

13-2-5: Report to the Board on ARB's Program Priorities for 2013

The Executive Officer will present to the Board a preview of anticipated Board activities in 2013.

13-2-2: Public Meeting to Consider Approval of the South Coast Air Basin 2012 PM2.5 and Ozone State Implementation Plans

The Board will consider the approval of the 2012 South Coast AQMP that includes the South Coast's State Implementation Plan (SIP) for attaining the 24-hour PM2.5 standard, and a SIP update to address the 1-hour ozone standard in the South Coast Air Basin. The SIPs identify the strategies needed to bring the Basin into attainment with the federal PM2.5 standard by 2014, the federal 1-hour ozone standard by 2022, and sets conformity budgets for the PM2.5 SIP. The 2012 AQMP also includes measures and actions to implement the federally approved 8-hour ozone SIP.

13-2-3: Public Hearing to Consider Amendments to Regulations for Gasoline and Diesel Fuel Test Methods

Staff will present to the Board proposed amendments to the California reformulated gasoline (CaRFG) and California diesel fuel (CDF) regulations. The amendments' primary purpose is to add new test methods that will enhance ARB's ability to enforce the

CaRFG regulations. Staff will also propose updating several existing CaRFG and CDF test methods to their most recent versions, and remove of an obsolete test method for measuring sulfur in CaRFG.

13-2-4: Public Hearing on Update to Proposition 1B: Goods Movement Emission Reduction Program Guidelines

Staff will present to the Board proposed updates to the Program Guidelines that outline the eligible equipment projects, which will reduce diesel emissions and health impacts from freight movement along California's four priority trade corridors. The proposed updates include funding level revisions for various equipment projects and administrative changes.

CLOSED SESSION

The Board will hold a closed session, as authorized by Government Code section 11126(e), to confer with, and receive advice from, its legal counsel regarding the following pending or potential litigation:

POET, LLC, et al. v. Goldstene, et al., Superior Court of California (Fresno County), Case No. 09CECG04850; plaintiffs' appeal, Court of Appeal No. F064045.

Rocky Mountain Farmers Union, et al. v. Goldstene, U.S. District Court (E.D. Cal. Fresno), Case No. 1:09-CV-02234-LJO-DLB; interlocutory appeal, U.S. Court of Appeal, Ninth Circuit Nos. 09-CV-02234 and 10-CV-00163.

American Fuels and Petrochemical Manufacturing Associations, et al. v. Goldstene, et al., U.S. District Court (E.D. Cal. Fresno) Case No. 1:10-CV-00163-AWI-GSA; interlocutory appeal, U.S. Court of Appeal, Ninth Circuit Nos. 09-CV-02234 and 10-CV-00163.

Association of Irritated Residents, et al. v. U.S. E.P.A., 2011 WL 310357 (C.A.9), (Feb. 2, 2011).

California Dump Truck Owners Association v. California Air Resources Board, U.S. District Court (E.D. Cal. Sacramento) Case No. 2:11-CV-00384-MCE-GGH.

Engine Manufacturers Association v. California Air Resources Board, Sacramento Superior Court, Case No. 34-2010-00082774.

Citizens Climate Lobby and Our Children's Earth Foundation v. California Air Resources Board, San Francisco Superior Court, Case No. CGC-12-519554.

California Chamber of Commerce et al. v. California Air Resources Board et al., Sacramento Superior Court, Case No. 34-2012-80001313.

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.

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IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT THE CLERK OF THE BOARD:
1001 I Street, 23rd Floor, Sacramento, California 95814
(916) 322-5594
ARB Homepage: www.arb.ca.gov

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- A disability-related reasonable accommodation.

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- Un intérprete que esté disponible en la audiencia.
- Documentos disponibles en un formato alterno u otro idioma;
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SMOKING IS NOT PERMITTED AT MEETINGS OF THE CALIFORNIA AIR RESOURCES BOARD

California Environmental Protection Agency

Air Resources Board

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Kern County Board of Supervisors

January 24th & 25th, 2013

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CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER APPROVING THE SAN JOAQUIN VALLEY PM2.5 STATE IMPLEMENTATION PLAN AND OVERVIEW OF PM2.5 SCIENCE AND RESEARCH

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider approving the San Joaquin Valley 2012 PM2.5 State Implementation Plan (2012 PM2.5 Plan) developed and adopted by the San Joaquin Valley Air Pollution Control District (San Joaquin Valley or District). If approved by the Board, ARB will submit the 2012 PM2.5 Plan to the United States Environmental Protection Agency (U.S. EPA) as a revision to the California State Implementation Plan (SIP). At the hearing, ARB staff will also provide an overview of the latest air quality science and on-going research which was used in developing the 2012 PM2.5 Plan.

DATE: January 24, 2013

TIME: 9:00 a.m.

PLACE: Kern County Board of Supervisors
Board Chambers, 1st Floor
1115 Truxtun Avenue
Bakersfield, California 93301

This item will be considered at a one-day meeting of the Board in Bakersfield, which will commence at 9:00 a.m., January 24, 2013. Please consult the meeting agenda, which will be available at least ten (10) days before January 24, 2013, to determine the schedule on which this item will be considered.

The federal Clean Air Act (Act) establishes planning requirements for areas that exceed the health-based National Ambient Air Quality Standards (standard). These nonattainment areas must develop and implement a SIP that demonstrates how they will attain the standard by specified dates.

In December 2006, U.S. EPA lowered the 24-hour standard for fine particulate matter (PM2.5) from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. Effective December 14, 2009, U.S. EPA designated the San Joaquin Valley as nonattainment for this more stringent 24-hour PM2.5 standard. The District must develop and implement a SIP that addresses Act planning requirements and establishes the strategy for attaining the standard as expeditiously as practicable, but no later than December 2019. The District prepared the 2012 PM2.5 Plan to address these requirements, and their Governing Board adopted the 2012 PM2.5 Plan on December 20, 2012.

The 2012 PM2.5 Plan demonstrates attainment by including new emission reductions, to occur each year between now and 2019, from implementing a combination of ARB and District programs. The District has committed to additional measures, including

further strengthening their wood burning curtailment program and additional requirements on commercial cooking operations, to bring the entire San Joaquin Valley into attainment by 2019. The 2012 PM2.5 Plan includes comprehensive emission inventories, reasonable further progress milestones, an assessment of reasonably available control measures and technologies, and identification of contingency measures if they fail to meet a milestone or attain the standard. The 2012 PM2.5 Plan also includes motor vehicle transportation conformity budgets developed using EMFAC2011 that reflect the latest planning assumptions.

ARB staff has reviewed the 2012 PM2.5 Plan and has concluded that it meets the applicable Act requirements. ARB staff is recommending that the Board approve the 2012 PM2.5 Plan as a revision to the California SIP.

A written ARB Staff Report will be available prior to the meeting. Copies of the report may be obtained from ARB's Public Information Office, 1001 I Street, First Floor, Environmental Services Center, Sacramento, California, 95814, (916) 322-2990. The report may also be obtained from ARB's website at:
http://www.arb.ca.gov/planning/sip/sip.htm

Interested members of the public may present comments orally or in writing at the meeting and may be submitted by postal mail or by electronic submittal before the meeting. To be considered by the Board, written comments not physically submitted at the meeting must be received **no later than 12:00 noon, January 23, 2013,** 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

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to:
http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and verbal comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the meeting so that ARB staff and Board members have additional time to consider each comment. Further inquiries regarding this matter should be directed to Ms. Sylvia Vanderspek, Manager, Particulate Matter Analysis Section, Planning and Technical Support Division at (916) 324-7163 or Dr. Patricia Velasco, Staff Air Pollution Specialist, Particulate Matter Analysis Section, Planning and Technical Support Division at (916) 323-7560.

SPECIAL ACCOMMODATION REQUEST

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CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: 12/4/12

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 at www.arb.ca.gov.

State of California

California Environmental Protection Agency
AIR RESOURCES BOARD

Staff Report

Proposed Revision to the PM2.5 State Implementation Plan (SIP) for the San Joaquin Valley

Release Date: January 11, 2013
Scheduled for Consideration: January 24, 2013

This document has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does the mention of trade names or commercial products constitute endorsement or recommendation for use.

Electronic copies from this document are available for download from the Air Resources Board's Internet site at: http://www.arb.ca.gov/planning/sip/sjvpm25/sjvpm25.htm. In addition, written copies may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, 1st Floor, Visitors and Environmental Services Center, Sacramento, California 95814, (916) 322-2990.

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.

For questions, contact:

Ms. Sylvia Vanderspek
Manager, PM Analysis Section
Phone: (916) 324-7163
Email: svanders@arb.ca.gov

or

Ms. Patricia Velasco, Ph.D.
Project Lead
Phone: (916) 323-7560
Email: pvelasco@arb.ca.gov

P.O. Box 2815
Sacramento, California 95814

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I. INTRODUCTION

The San Joaquin Valley Air Pollution Control District (District) adopted on December 20, 2012 a revision to the State Implementation Plan (SIP or 2012 PM2.5 Plan) to address the 24-hour fine particulate matter (PM2.5) ambient air quality standard of 35 ug/m3. The SIP demonstrates that the San Joaquin Valley (Valley) will attain the 24-hour PM2.5 standard by 2019, with many areas of the Valley reaching attainment well before 2019. The SIP shows that by 2017, approximately 90 percent of Valley residents will be living in communities meeting this air quality standard.

The Air Resources Board's (ARB) mobile source control program will be providing major new emission reductions of oxides of nitrogen (NOx) and particulate matter needed for attainment of the PM2.5 standard. Mobile source PM2.5 and NOx are expected to decrease by almost 50 and 60 percent, respectively, between 2007 and 2019. The District wood burning curtailment program is also an essential measure providing reductions predicted to bring all but one Valley location into attainment prior to 2019. To address this remaining localized area of nonattainment in Bakersfield, the District will develop a rule to further reduce emissions from commercial cooking operations. This measure will provide the final increment of reductions needed to demonstrate attainment at this location by the deadline of 2019.

SIP technical analyses, including air quality modeling, establish and quantify the relative effectiveness of reducing each PM2.5 precursor pollutant. This scientific information is specific to the Valley and indicates that the most important pollutants to reduce for the 24-hour PM2.5 standard are direct PM2.5 and NOx emissions. Ammonia reductions are an order of magnitude less effective than NOx emission reductions, providing only a slight benefit. Nevertheless, since a small reduction in PM2.5 could occur from further reductions in ammonia emissions, the District has included a measure to assess the feasibility of further ammonia controls. The District will also conduct further research on ammonia emissions and implement any feasible and cost-effective mitigation measures identified through this process.

The federal Clean Air Act establishes the SIP requirements for areas that are designated nonattainment for an air quality standard. U.S. EPA first set standards for PM2.5 in 1997, adopting a 24-hour PM2.5 standard of 65 µg/m3 and an annual standard of 15 µg/m3. The key elements of SIPs are a demonstration of attainment of the standard, including identification of the most expeditious date for attainment, determination of the amount of emission reductions needed, and design of the control strategy[1]. In 2006, the 24-hour PM2.5 standard was lowered to 35 µg/m3. This report discusses how the District's 2012 PM2.5 SIP demonstrates attainment of this standard. The District's adopted SIP can be found at: www.valleyair.org/Air_Quality_Plans/PM25Plans2012.htm.

[1] In 2008, ARB and the District submitted a plan to U.S. EPA demonstrating how the San Joaquin Valley would attain the 1997 PM2.5 standards by 2014. U.S. EPA approved this plan in 2011. Although U.S. EPA further revised the annual standard in December 2012, a separate, future planning process will address this new standard.

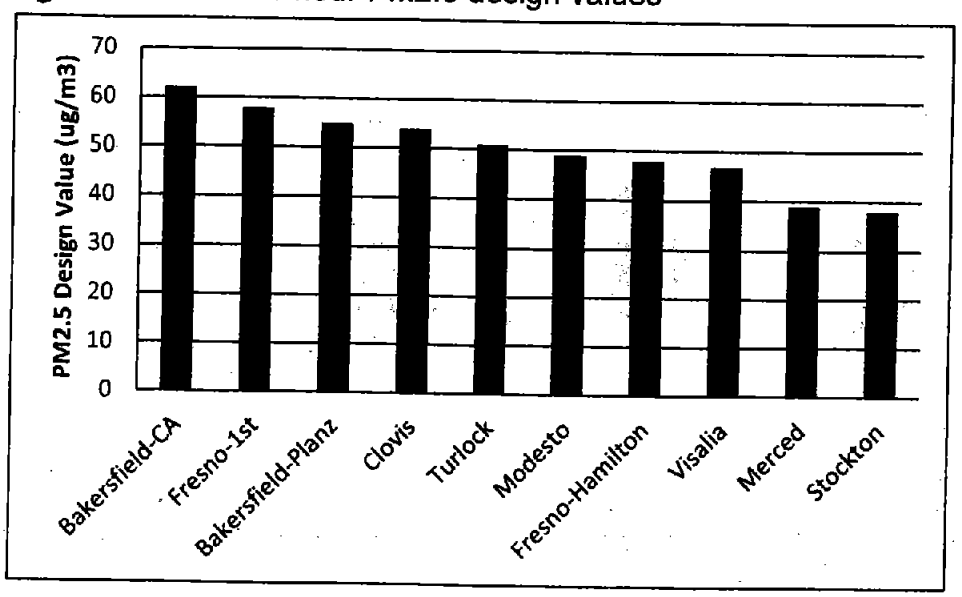
II. NATURE OF THE SAN JOAQUIN VALLEY PM2.5 AIR QUALITY PROBLEM

PM2.5 is a complex mixture of many different species generated from a wide array of sources. Some PM2.5 is emitted directly into the air (primary particles) in the form of soot, smoke or dust. PM2.5 can also be formed in the atmosphere (secondary particles) from the reactions of precursor gases, forming compounds such as ammonium nitrate and ammonium sulfate. The relative mixture of these constituents in a region drives the nature of the needed control strategy.

The San Joaquin Valley is one of the most intensively studied locations in the world, providing a wealth of information regarding the nature of the Valley's PM2.5 problem. ARB and the District operate a comprehensive monitoring network that provides ongoing measurement of PM2.5 concentrations and chemical composition. In addition, numerous special studies have been conducted. The largest of these, the California Regional Particulate Air Quality Study (CRPAQS), was conducted in 1999 through 2001. The study included monitoring at over 100 locations, with results published in peer reviewed publications and presented at national and international conferences. CRPAQS findings continue to provide a strong scientific foundation for planning efforts. The Valley also continues to be a focus of intensive study, with more recent programs including CalNex 2010, and the upcoming DISCOVER-AQ study to be conducted in 2013.

PM2.5 concentrations in the Valley exhibit a strong seasonal pattern, with concentrations over the 24-hour standard occurring primarily during the winter months. Cold temperatures, fog, stagnant airflow, and extended periods without rainfall result in episodes of elevated PM2.5 that can persist for a week or more. Episodic activities such as seasonal wood burning also add to the pollution burden during the winter. As shown in Figure 1, PM2.5 concentrations are generally higher in the central and southern portions of the Valley, with highest values recorded in the urban areas of Fresno and Bakersfield. The high values used for SIP planning purposes are called design values, and are calculated on a three year average.

Figure 1. 2011 24-hour PM2.5 design values



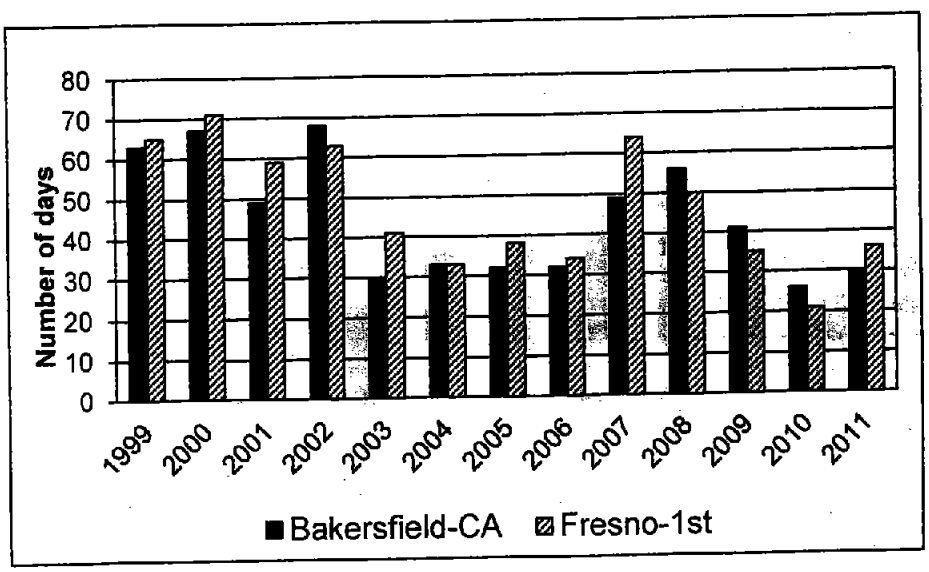
The Valley is making progress in reducing PM2.5 pollution, both annual average and 24-hour PM2.5 concentrations. Between 2001 and 2011, annual average design values have decreased between 30 and 40 percent. The largest decreases occurred in the northern and central portions of the Valley, where most sites now meet the annual standard. While the southern Valley has shown a slower rate of improvement, sites are nearing attainment, with 2011 design values 10 to 20 percent over the annual standard.

With respect to the 24-hour standard, the most pronounced progress occurred between 2001 and 2004. Over this period, the three year average design values show a consistent downward trend. During this timeframe, ammonium nitrate levels were decreasing consistent with implementation of NOx emission reduction strategies in the Valley.

Characterizing the overall design value trend in more recent years is complex. Although the design value is the planning metric used to assess compliance with the standard, evaluation of a variety of air quality indicators provides a broader understanding of the nature of air quality progress. It is also necessary to account for exceptional events and yearly variability in weather conditions, which can strongly affect PM2.5 concentrations. All these indicators and factors must be considered when interpreting air quality trends and the effects of the ongoing control program.

Figure 2 illustrates the year to year variability in the number of days over the 24-hour PM2.5 standard in Bakersfield and Fresno. The large wildfires that occurred in 2008 throughout central and northern California affected the number of exceedance days in that year. In addition, some years have meteorological conditions that are much more conducive to the formation of PM2.5 than others. Analyses of meteorological data show that the years 2000, 2002, 2007, and 2011 were especially conducive to periods of PM2.5 formation and multi-day pollution episodes. These factors can mask the benefit of declining emissions if not accounted for in the analysis of the air quality trend.

Figure 2: Trend in measured days over the 24-hour standard of 35 $\mu g/m^3$

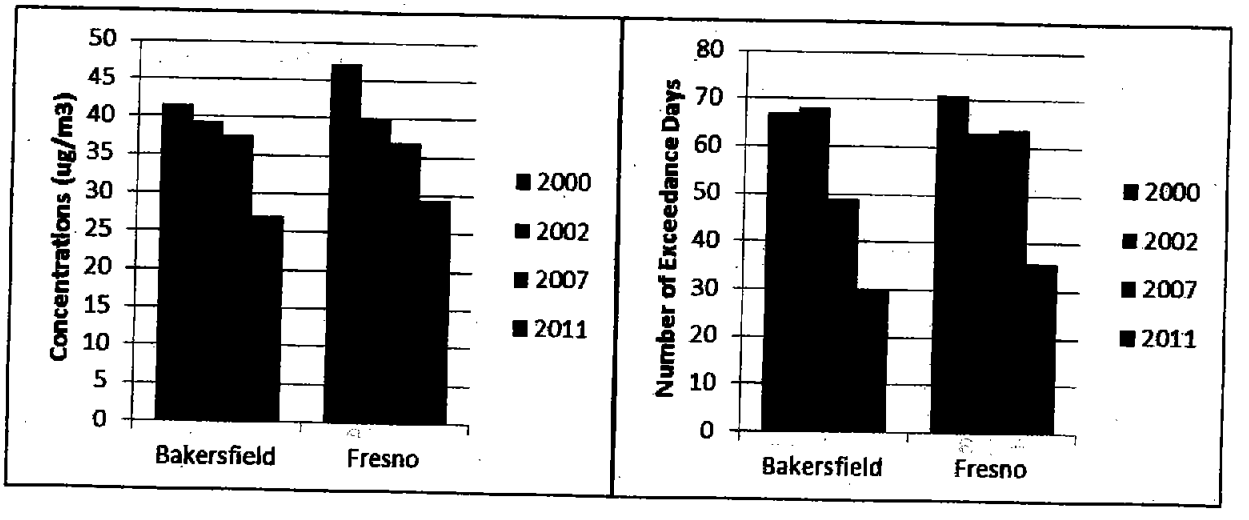


To help understand the interplay between declining emissions and year to year meteorological variability, the years 2000, 2002, 2007, and 2011 were compared for both winter average 24-hour PM2.5 concentrations and the number of days over the standard (Figures 3 and 4).

Despite the adverse meteorology in these four years, there is a general downward trend in both PM2.5 levels and the frequency of exposure as a result of the continuing decline in emissions. In addition, the number of days with the highest concentrations (over 65 ug/m3) has also decreased, dropping from 22 days in Bakersfield in 2000, to 14 days in 2007, and 6 days in 2011.

Figure 3. Change in winter average 24-hour PM2.5 concentrations in years with PM2.5 conducive weather

Figure 4. Change in days over the 24-hour PM2.5 standard in years with PM2.5 conducive weather



This air quality progress is driven by decreases in the key chemical constituents that make up the PM2.5 mass and the associated emission reductions from sources that contribute to those constituents. During the winter, ammonium nitrate is the largest contributor to PM2.5, especially in the central and southern portions of the Valley, where it comprises approximately 60 percent of the PM2.5 mass. Carbonaceous compounds (organic and elemental carbon) are the next largest contributor. Together, ammonium nitrate and carbon comprise 85 to 90 percent of the PM2.5 mass.

Routine measurements of these chemical constituents have been collected at four locations in the Valley since 2002. Between 2002 and 2011, winter-average 24-hour concentrations of organic carbon have decreased by approximately 50 percent and ammonium nitrate by approximately 40 percent. The major sources of winter-time organic carbon in the Valley are mobile sources, residential wood burning, and commercial cooking. During that same time period, PM2.5 emissions from mobile sources decreased by nearly 25 percent due to ongoing implementation of ARB's mobile source control program. In addition, the decrease in organic carbon reflects substantial benefits from the implementation of the District rule prohibiting residential wood-burning on high PM2.5 days. Through a series of rule amendments, the threshold

for curtailing burning was tightened to 30 $\mu g/m^3$ in 2008. As a result, PM2.5 emissions from residential wood burning decreased 60 percent. Although a District rule controls emissions from certain commercial cooking operations, as a result of population growth, PM2.5 emissions from commercial cooking have decreased only modestly (approximately 10 percent).

Ammonium nitrate is formed in the atmosphere from chemical reactions of NOx, volatile organic compounds (VOCs), and ammonia. It is therefore important to understand which precursor controls have been most effective in reducing ammonium nitrate concentrations. A number of different methods can be used to assess this, including evaluation of emissions inventories, review of monitoring data, and air quality modeling.

Evaluation of both emissions inventory and monitoring data suggest that in the Valley's ammonia-rich conditions, NOx, rather than ammonia controls are more effective in reducing wintertime PM2.5 concentrations. In addition, air quality modeling has shown that while large reductions in NOx lead to commensurate reductions in ammonium nitrate, comparable reductions in ammonia are much less effective. On a per ton basis, reductions in NOx are approximately an order of magnitude more effective than reductions in ammonia. Finally, air quality modeling has indicated that VOC emission reductions produce no PM2.5 benefit, and in some instances may actually lead to a very small disbenefit.

As a result, programs aimed at reducing NOx emissions have played an important role in reducing ammonium nitrate concentrations. Between 2002 and 2011, Valley NOx emissions decreased by about 38 percent, with a commensurate reduction in both gaseous NOx concentrations and ammonium nitrate concentrations. Major NOx reductions during this time period have resulted from the ongoing implementation of both new vehicle standards for passenger and heavy-duty diesel vehicles and equipment, as well as rules accelerating the turnover of the legacy diesel fleet. District rules have also resulted in ongoing reductions in stationary source NOx emissions over this time period.

III. DEMONSTRATING ATTAINMENT

A. Attainment Demonstration

1. Grid-Based Modeling

Consistent with U.S. EPA guidelines, ARB staff conducted air quality modeling to predict future PM2.5 concentrations at each monitoring site in the San Joaquin Valley. This modeling was used to identify the most expeditious attainment date, the relative benefits of controlling different PM2.5 precursor pollutants, and the magnitude of emission reductions needed from each pollutant. Following U.S. EPA's guidance, the modeling addressed the most severe air quality days, which relies on characterization of episodic daily emissions.

For the 2012 PM2.5 Plan, 2007 was chosen as the base year for the air quality modeling. The design values recorded in 2007 were some of the highest in recent years

and analysis indicates that the meteorology was one of the most conducive to PM2.5 formation. Thus, the selection of 2007 represents a health protective approach to the attainment demonstration modeling.

The attainment demonstration incorporates modeling that includes the benefits of all adopted regulations plus additional scenario and sensitivity runs. Continued implementation of ARB and District ongoing control programs provide new emission reductions each year, resulting in a forecasted 55 percent decrease in NOx emissions, and about a 30 percent decrease in PM2.5 emissions between 2007 and 2019. Modeling these reductions showed attainment of the 24-hour PM2.5 standard by 2019 in all counties except Kings and Kern.

ARB staff then modeled a new scenario reflecting the ongoing control program coupled with an enhanced wood burning curtailment program designed to prevent burning on days that may lead up to a PM2.5 exceedance. The modeling results for this scenario indicate that this regional control would bring almost the entire Valley into attainment by 2019, with only the Bakersfield-California Street site a remaining localized area of nonattainment. The predicted design values from this modeling are shown in Table 1. The substantial improvement in design values reflect ammonium nitrate concentrations that are predicted to decrease by nearly 45 percent, organic carbon concentrations by approximately 65 percent, and elemental carbon concentrations by nearly 80 percent.

Table 1. 2019 modeled 24-hour PM2.5 design values with ongoing programs and enhanced wood burning curtailment

Monitoring Site	2007 Design Value	2019 Modeled Design Value ($\mu g/m^3$)
Bakersfield - California	66	35.7
Bakersfield - Planz	68	32.9
Corcoran - Patterson	61	32.1
Visalia - N. Church	58	29.4
Fresno - Hamilton	61	28.6
Fresno-1st	63	30.5
Clovis	58	28.6
Merced	48	22.6
Modesto	55	24.7
Stockton	45	21.4

In order to determine the emission reductions needed to bring the final site into attainment, ARB staff conducted additional modeling sensitivity runs to assess the relative efficacy of further reductions in different PM2.5 precursors in Kern County. This modeling demonstrated that on a relative basis, the greatest benefits are achieved from reductions in directly emitted PM2.5, followed by NOx, with PM2.5 emission reductions approximately eight times more effective than NOx.

Because the remaining nonattainment problem is very localized, ARB staff examined the emissions inventory in the area surrounding the Bakersfield-California Street

monitoring site. This analysis identified commercial cooking, residential fuel combustion, and on-road motor vehicles as the top three sources of directly emitted PM2.5. Although a District rule controls emissions from some commercial cooking operations, emissions from this category are forecasted to increase slightly into the future due to population growth. Therefore, further control of PM2.5 emissions from commercial cooking operations was identified as the most effective approach to meet the standard at the remaining nonattainment location. The final attainment demonstration for Bakersfield-California, the Valley design site is shown in Table 2.

Table 2. Attainment demonstration for the Bakersfield-California design value site.

2007 Design Value ($\mu g/m^3$)	2019 Design Value with Wood Burning Program Enhancement ($\mu g/m^3$)	2019 Final Design Value ($\mu g/m^3$)
65.6	35.7	35.3

Note: The benchmark for attainment is a design value that is equal to or less than 35.4 $\mu g/m^3$.

The final attainment demonstration for Bakersfield-California includes two new District measures, the enhanced wood burning program and commercial cooking controls. The forecasted 2019 design value for Bakersfield-California with implementation of ongoing control programs and an enhanced residential wood burning curtailment program is 35.7 ug/m3. Model sensitivity analysis of commercial cooking controls shows a 0.6 ug/m3 reduction, bringing the predicted design value to 35.1 ug/m3. However, due to a small increase in motor vehicle emissions resulting from use of updated vehicle activity data, the projected design value was adjusted upward by 0.2 ug/m3. The new data from the San Joaquin Valley Metropolitan Planning Organizations (MPOs) represents about a one percent increase in Valleywide NOx emissions. A modeling sensitivity run served as the basis for this adjustment to the design value. In total, with reductions from existing programs, further wood burning restrictions, new controls on commercial cooking, and updated MPO data, the predicted design value is 35.3 ug/m3. As a result, the attainment demonstration meets U.S. EPA's requirement for an attainment design value of no greater than 35.4 ug/m3.

2. PM2.5 Attainment Plan Precursors

As discussed earlier, ambient PM2.5 is comprised of many different constituents and as a result there are multiple precursor pollutants that lead to PM2.5 formation (directly emitted PM2.5, NOx, SOx, VOCs, and ammonia). U.S. EPA's PM2.5 implementation rule (Rule) specifies that a precursor is considered "significant" for control strategy development purposes when a significant reduction in the emissions of that precursor pollutant leads to a significant decrease in PM2.5 concentrations. Such pollutants are

known as "PM2.5 attainment plan precursors".[2] The Rule also establishes a presumption that PM2.5, SOx and NOx are attainment plan precursors, while VOCs and ammonia are not significant precursors. U.S. EPA noted in the Rule that the uncertainties in ammonia emission inventories and efficacy of ammonia control measures did not provide enough evidence to consider ammonia as a mandatory PM2.5 attainment plan precursor.

The U.S. EPA Rule does not define significance nor define a quantitative test for determining significance. When it approved the Valley's annual PM2.5 plan in 2011, U.S. EPA determined that while ammonia reductions provided a small benefit, they were not significant when compared to the benefits of reducing NOx. The only PM2.5 attainment plan precursors identified and approved by U.S. EPA for the annual standard are PM2.5, NOx, and SOx.

In developing the PM2.5 SIP for the 24-hour standard, precursor sensitivity modeling was again done based on the most recent data. This modeling showed that a 25 percent reduction in NOx and PM2.5 would reduce the 2019 design value at Bakersfield by 10 to 12 percent respectively, while a similar reduction in ammonia would reduce the design value by only one percent. On a per ton basis, reductions in the required attainment precursors - NOx, SOx, and PM2.5 - are ten to forty times more beneficial than ammonia reductions. This modeling also indicates that reductions in VOCs have no benefit, and may in some cases cause a very slight increase in PM2.5. Based on the current science showing the relative effectiveness of precursor reductions, the appropriate attainment plan precursors for PM2.5 remain PM2.5, NOx, and SOx.

While ammonia has not been shown to be a significant precursor for PM2.5, ARB staff supports the District ammonia feasibility measure to conduct further research on ammonia emissions and implementation of any feasible and cost-effective mitigation measures identified through this process. This approach is consistent with U.S. EPA's Rule which enable states to focus on the most effective control strategies by distinguishing among PM2.5 precursors on the basis of significant contribution to attainment.

3. Attainment Date

Nonattainment areas must attain the PM2.5 standards as expeditiously as practicable, but no later than 2019. Looking at the modeled design values and rates of emission reductions, by 2017, approximately 90 percent of the population in the Valley is predicted to live in areas that meet the standard, and the 2012 PM2.5 Plan demonstrates full attainment in 2019 at the last remaining site in Bakersfield. The District assessed whether attainment at this last site could be accelerated, and calculated that emission reductions sufficient to achieve about a 1 ug/m3 decrease in design value would be needed in order to accelerate attainment at this location by one year.

As discussed, reductions in PM2.5 and NOx emissions are the most effective in reducing PM2.5 concentrations. ARB regulations and California's incentive programs

[2] (72 FR 20586).

are reducing mobile source NOx and PM2.5 emissions as expeditiously as possible, with increasingly stringent new engine standards and the early turnover of legacy fleets. In addition, new District control measures addressing residential wood burning and commercial cooking will be implemented in advance of 2019 to provide early emission reductions.

In looking for other potential ways to accelerate attainment by one year at the remaining nonattainment site, modeling sensitivity runs were evaluated. The modeling showed that to achieve a 1 ug/m3 decrease in the design value at the Bakersfield site all ammonia emissions in Kern County would need to be eliminated. On a Valleywide basis a 34 percent reduction in ammonia emissions would be needed. Reductions on this scale in this timeframe were not found to be feasible. Ammonia is currently being controlled through the District Confined Animal Feeding Operations rule, and research is currently underway to provide an improved characterization of ammonia emissions and the potential for further mitigation. Given the need for further research, completion of the ammonia feasibility study is needed prior to determination of whether further ammonia emission control could accelerate attainment.

4. Weight of Evidence

U.S. EPA's modeling guidance requires that the modeled attainment demonstration be accompanied by a weight of evidence analysis to provide a set of complementary analyses. Examining an air quality problem in a variety of ways provides a more informed basis for the attainment strategy as well as a better understanding of the overall problem and the level and mix of emissions controls needed for attainment.

Appendix G of the 2012 PM2.5 Plan provides the weight of evidence analysis conducted by ARB staff. Following U.S. EPA guidance, this includes assessment of trends in air quality and emissions, source-receptor models and other diagnostic analyses, additional modeling evaluations, and description of a conceptual model of PM2.5 in the Valley. The weight of evidence analysis draws upon the wealth of data collected in the Valley over the years, both from the routine monitoring network, as well as special studies. The substantial continuing reductions that will result from implementation of the ongoing control program, coupled with new measures addressing residential wood burning and cooking are consistent with past progress and the results predicted in the modeled attainment demonstration and support the selected control approach and the associated attainment date of 2019.

B. Control Strategy

Attainment of the 24-hour PM2.5 standard in the Valley will require the combined efforts of ARB and District control programs. As a result of these programs, NOx emissions are forecasted to decrease by 55 percent and PM2.5 emissions by about 30 percent by 2019. The following sections highlight ARB's ongoing control programs and new District measures that provide the emission reductions included in the attainment demonstration.

The 2012 PM2.5 Plan is built upon the District's adopted strategy that is the foundation for the 8-hour ozone and annual PM2.5 plans approved by U.S. EPA in 2011. In

addition, the District has committed to pursue five new regulatory control measures to further reduce PM2.5 and NOx emissions as outlined in Table 3.

Table 3. District regulatory control measures.

Rule	Amendment Date	Compliance Date	Emission Reductions
Rule 4308 Boilers, Steam Generators, and Process Heaters 0.075 to <2 MMBtu/hr	2013	2015	TBD
Rule 4692 Commercial Charbroiling	2016	2017	0.4 tpd PM2.5
Rule 4901 Wood Burning Fireplaces and Wood Burning Heaters	2016	2016	1.5 tpd of PM2.5
Rule 4905 Natural Gas-Fired, Fan-Type Residential Central Furnaces	2014	2015	TBD
Rule 9610 SIP-Creditability of Incentives	2013	2013	TBD

Two rule amendments focus on reducing directly emitted PM2.5 and are key elements of the attainment control strategy. This includes expanding the scope of Rule 4692 for commercial charbroiling to include under-fired charbroilers, similar to the commitment made by the South Coast Air Quality Management District (South Coast). The South Coast and the District continue to partner in efforts to evaluate and advance technologies for this source sector. In addition, the District has committed to further strengthening the successful residential wood burning curtailment program under Rule 4901. Compliance dates for these measures are intended to provide early emission reductions.

Other rules will reduce NOx emissions from residential central furnaces, and boilers, steam generators, and process heaters, with benefits to be quantified as part of the rulemaking. No reductions were included in the attainment demonstration. Working with U.S. EPA, the District also plans to pursue a new rule to allow SIP credit for emission reductions from incentives.

The 2012 PM2.5 Plan also identifies seven further study measures which upon completion could result in opportunities for additional emission reductions. These study measures seek to explore where and how addition reductions may be achieved in the future. The District is committing to release study reports by the dates listed in Table 4.

Table 4. District further study measures.

Control Measure	Description	Completion Date
Rule 4103 Open Burning	Evaluate the feasibility of postponed burning activities every 5 years, as outlined in the current rule.	2015
Rule 4106 Prescribed Burning	Examine the feasibility of implementing a biomass removal program similar to the Placer County program.	2013
Rule 4311 Flares	Review flare minimization plans and annual reports for further emission reduction opportunities.	2013
Rule 4550 CMPs	Analyze existing studies and support new studies to establish a more accurate inventory of PM2.5 emissions and identify potential addition emission reduction opportunities.	2014
Rule 4570 Confined Animal Facilities	Analyze existing studies on ammonia at dairies and evaluate potential ammonia controls for their effectiveness in reducing PM2.5 concentrations in the Valley.	2017
SC 001 Lawn Care Equipment	Evaluate emissions inventory and technology demonstration efforts to identify potential emission reduction opportunities.	2013
SC 005 Asphalt/Concrete Operations	Examine feasibility of warm-mix asphalt as a potential emission reduction opportunity.	2013

Over the past five years, ARB adopted a number of regulations aimed at reducing emissions of diesel particulate matter and oxides of nitrogen from freight transport sources like heavy-duty diesel trucks, and off-road sources like large construction equipment. Phased implementation of these regulations will produce increasing emission reduction benefits over time, as the regulated fleets are retrofitted, and as older and dirtier portions of the fleets are replaced with newer and cleaner models at an accelerated pace.

ARB's longstanding programs to reduce emissions from passenger vehicles along with the smog check program provide continuing benefits needed for attainment of the 24-hour PM2.5 standard. Implementation of the ARB 2007 State Strategy approved by U.S. EPA[3] is providing new reductions included in the PM2.5 SIP for the San Joaquin Valley. Since development of the 2007 State Strategy, the ARB measures listed in Table 5 have been adopted and improvements to California's smog check and vehicle retirement programs have been made.

[3] Approval and Promulgation of Implementations Plans; California; 2008 San Joaquin Valley PM2.5 Plan and 2007 State Strategy-Federal Register Vol. 76, No. 217, Page 69896

Table 5. Measures in the 2007 State Strategy

Smog Check Improvements
Expanded Vehicle Retirement (AB 118)
Modifications to Reformulated Gasoline Program
Cleaner In-Use Heavy-Duty Trucks
Auxiliary Ship Engine Cold Ironing & Other Clean Tech
Cleaner Main Ship Engines and Fuel
Port Truck Modernization
Clean Up Existing Harbor Craft
Cleaner In-Use Off-Road Equipment
Enhanced Vapor Recovery for Above-Ground Storage Tanks
Additional Evaporative Emission Standards
Consumer Products Program
Pesticide Regulation (adopted by Department of Pesticide Regulation)

Clean New and In-Use Heavy-Duty Trucks

A central control element of ARB's 2007 State Strategy is increasingly stringent standards for new trucks as shown in the Table 5. New heavy-duty trucks sold since 2010 must emit 98 percent less NOx and PM2.5 than new trucks sold in 1986.

Table 5: Phase-in of truck engine standards.

Model Year	**Applicable Standard g/bhp-hr**	
	NOx	**PM**
1986 and older	10.7	0.60
1987-2006	From 6.0 to 2.0	From 0.6 to 0.10
2007-2009	1.1	0.01
2010	0.2	0.01

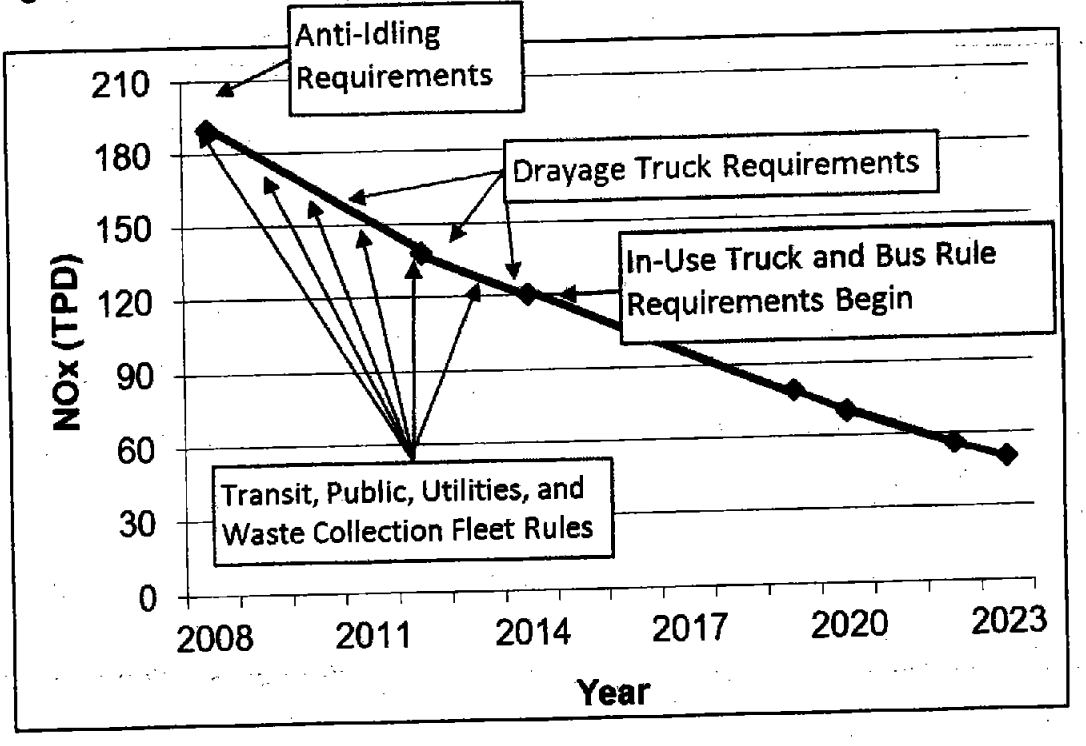
However, older, higher-emitting trucks with long service lives would stay on the road for many years to come. With attainment of the PM2.5 standards required soon after the cleanest trucks were introduced, the typically slow replacement of older trucks on the road with the latest models would not provide emission reduction benefits soon enough.

To address this, ARB developed the Cleaner In-use Heavy-duty Truck SIP measure. This measure leverages the benefits provided by new truck emission standards by accelerating introduction of the cleanest trucks. The Truck and Bus Regulation was adopted in December 2008, and amended in December 2010 to account for the reduced emissions resulting from the economic effects of the recession. This rule represents a multi-year effort to turn over the legacy fleet of engines and replace them with the cleanest technology available.

Starting in 2012, the Truck and Bus Regulation phases in requirements so that by 2023 nearly all vehicles will meet 2010 model year engine emissions levels. The regulation applies to nearly all diesel fueled trucks and buses with a gross vehicle weight rating greater than 14,000 pounds that are privately or federally owned, including on-road and off-road agricultural yard goats, and privately and publicly owned school buses. Moreover, the regulation applies to any person, business, school district, or federal government agency that owns, operates, leases or rents affected vehicles. The regulation also establishes requirements for any in-state or out-of-state motor carrier, California-based broker, or any California resident who directs or dispatches vehicles subject to the regulation. Finally, California sellers of a vehicle subject to the regulation would have to disclose the regulation's potential applicability to buyers of the vehicles.

Figure 5 below portrays reductions in NOx from in-use trucks within the San Joaquin Valley, and shows the benefits of ARB's mobile strategy.

Figure 5. Truck and bus regulation implementation.



In addition to the Truck and Bus Regulation, separate regulations reduce emissions from other public fleets, solid waste collection trucks and transit buses. Trucks that transport marine containers must comply with the drayage truck regulation.

Cleaner In-Use Off-Road Equipment

As with trucks, the control strategy for off-road equipment is based on increasingly stringent new off-road diesel engines. As a result, new construction, mining, industrial and oil drilling equipment will become progressively cleaner. The requirements vary according to the power rating of engines. Table 6 shows the schedule for phasing in tiered requirements for new off-road engines with a power rating between 175 and 300 horsepower (hp). Beginning in 2014, new Tier 4 construction equipment with the power rating shown below must emit about 96 percent less NOx and PM than new Tier 1 equipment sold in the year 2000.

Table 6: Phase-in of off-road engine standards

Model year	Level of Control	Applicable Emission Standard for New Off-road Engines 175<hp<300 g/bhp-hr	
		NOx	PM
1996-2002	Tier 1	6.9	0.4
2003-2005	Tier 2	4.9*	0.15
2006-2010	Tier 3	3.0*	0.15
2011-2013	Tier 4 interim	1.5	0.015
2014+	Tier 4 final	0.3	0.015

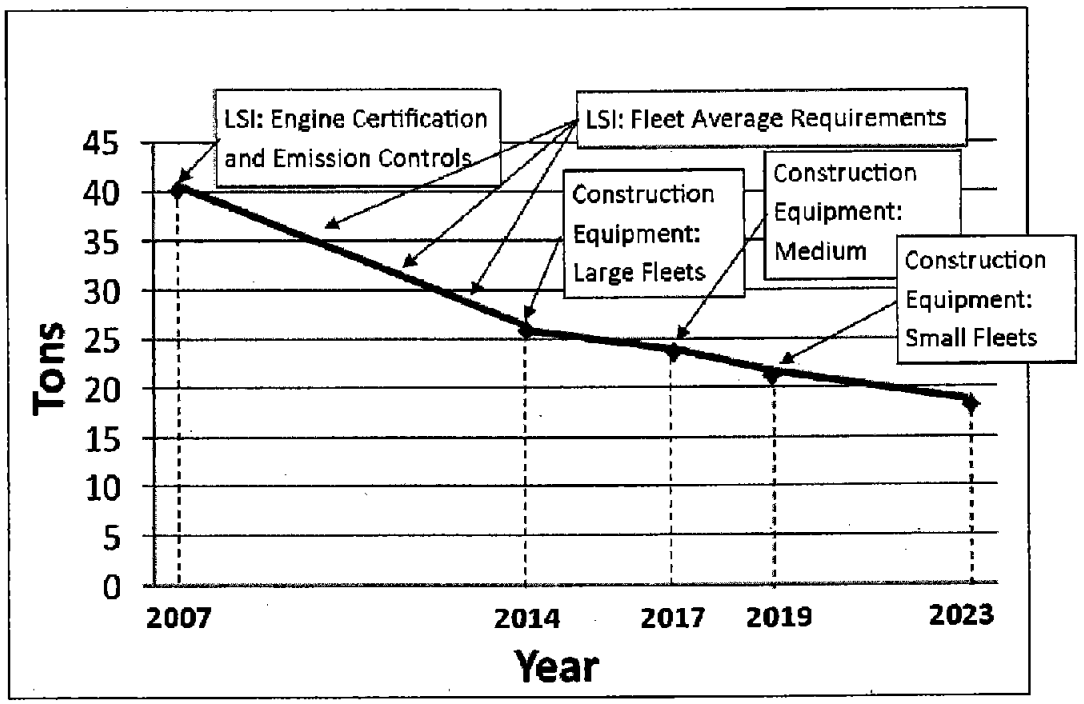
*Reflects combined limit for non-methane hydrocarbons and NOx

However, large diesel off-road equipment typically remains in use for long periods of time. As with heavy-duty trucks, this long life means that newer, lower-emitting engines would be introduced into fleets relatively slowly. The impact of this is that emission reductions and associated health benefits from these cleaner engines would also be fairly slow to materialize. To address this, the 2007 SIP included the Cleaner In-use Off-road Equipment measure.

First approved in 2007, the Off-Road Regulation was amended in 2010 in light of the impacts of the economic recession. Affected off-road equipment is used in construction, manufacturing, the rental industry, road maintenance, airport ground support and landscaping. In December 2011, the Off-Road Regulation was modified to include on-road trucks with two diesel engines.

Figure 6 portrays reductions in NOx emissions from off-road equipment within the San Joaquin Valley, and shows the benefits of ARB's mobile strategy.

Figure 6. Off-Road Regulation NOx emission reductions.



The Off-Road Regulation will significantly reduce emissions of diesel PM and NOx from the over 150,000 in-use off-road diesel vehicles that operate in California by requiring their owners to modernize their fleets and install exhaust retrofits. The regulation affects dozens of vehicle types used in thousands of fleets by requiring owners to modernize their fleets by replacing older engines or vehicles with newer, cleaner models, retiring older vehicles or using them less often, or by applying retrofit exhaust controls.

The Off-Road Regulation imposes idling limits on off-road diesel vehicles, requires a written idling policy, and requires a disclosure when selling vehicles. The regulation also requires that all vehicles be reported to ARB and labeled, restricts the addition of older vehicles into fleets, and requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing verified exhaust retrofits. The requirements and compliance dates of the Off-Road Regulation vary by fleet size.

Passenger Cars

The Board established California's Low Emission Vehicle (LEV) program in 1990, and the LEV2 program in 1998. Additionally, ARB's Zero Emission Vehicle (ZEV) regulation which affects passenger cars and light-duty trucks, has spurred movement towards commercialization of advanced clean cars and light-duty trucks. As a result, many new gasoline engines now emit extremely low emission levels of smog forming emissions. Conventional hybrid electric vehicles have been commercialized, and the number of models offered for sale is quickly expanding. Recently, battery electric vehicles and plug-in hybrid electric vehicles have been introduced for sale, and fuel cell electric vehicles are expected to follow.

ARB's Advanced Clean Cars (ACC) Program, approved in January 2012, is a pioneering approach of a 'package' of regulations, that although separate in construction, are related in terms of the synergy developed to address both ambient air quality needs and climate change. The ACC program combines the control of smog, soot causing pollutants and greenhouse gas emissions into a single coordinated package of requirements for model years 2015 through 2025. The program assures the development of environmentally superior cars that will continue to deliver the performance, utility, and safety vehicle owners have come to expect.

The ACC program approved by ARB in January 2012 included amendments affecting the current ZEV regulation through the 2017 model year in order to enable manufacturers to successfully meet 2018 and subsequent model year requirements. The ZEV amendments for 2018 and subsequent model years in the ACC program approved by ARB in January 2012 are intended to achieve commercialization through simplifying the regulation and pushing technology to higher volume production in order to achieve cost reductions.

The ACC Program will produce increasing benefits over time as new cleaner cars enter the fleet displacing older and dirtier vehicles. In this manner, the benefits in 2023 will be realized through the cumulative reduction in emissions achieved by new cars entering the fleet in 2017 through 2023. This program will continue to provide benefits well after 2025 as vehicles meeting the new standards replace older, higher-emitting vehicles.

Many additional programs are currently in place to reduce emissions from the passenger car legacy fleets and accelerate fleet turn over. The Smog Check Program ensures that passenger vehicles stay clean as they age and on-board diagnostic systems identify smog control problems. The Smog Check Program is continuously being improved to provide additional emission reductions such as requiring stricter inspection standards and annual inspection of older vehicles. ARB is also active in encouraging consumers with older dirtier vehicles to retire them early. Replacing older dirtier vehicles with cleaner new vehicles provides permanent emission reductions.

IV. OTHER CLEAN AIR ACT REQUIREMENTS

In addition to the elements related to the attainment demonstration, the Clean Air Act also requires that SIPs contain the following information:

- Base year emission inventories and future year forecasts for manmade sources of air pollution in the nonattainment area;
- Demonstration that all reasonably available control technology/reasonably available control measures (RACM/RACT) have been applied to existing sources;
- Reasonable Further Progress (RFP) towards attainment;
- Contingency measures in the event the controls fall short of achieving needed reductions; and
- Transportation conformity emission budgets to ensure transportation plans and projects are consistent with the SIP.

A. Emissions Inventory

SIPs must contain base-year inventories for PM2.5 and all precursor emissions as well as future year forecasts for all pollutants identified as PM2.5 attainment plan precursors. An emission inventory consists of a systematic listing of the sources of air pollutants with an estimate of the amount of pollutants from each source or source category over a given period of time.

ARB and District staff worked jointly to prepare an updated emission inventory for the 2012 PM2.5 Plan. This included a category-by-category review and update to the growth profiles using sector specific forecasts based on the most recent economic information available. Extensive effort also went into developing an inventory for use in the air quality modeling that appropriately represented the nature of episodic emissions during the winter months. Additional information on the emission inventory methodologies and resulting base and future year emissions can be found in Appendix B of the 2012 PM2.5 Plan.

B. Reasonably Available Control Measure Analysis

As specified in the Clean Air Act, SIPs shall provide for the implementation of all RACM as expeditiously as practicable, including at minimum RACT. U.S. EPA has interpreted RACM as those measures that are technologically and economically feasible and when considered in aggregate, would advance the attainment date by at least one year.

The District RACM/RACT demonstration includes a comparison of stationary source measures the District has implemented or plans to implement with U.S. EPA's list of suggested PM2.5 control measures along with other local district measures and comments received during the public process. Based on this, the District determined that four rules could be strengthened to provide reductions needed to attain the PM2.5 standard in the Valley. No additional feasible measures were identified that could in aggregate accelerate attainment by one year, as discussed previously in the attainment date section.

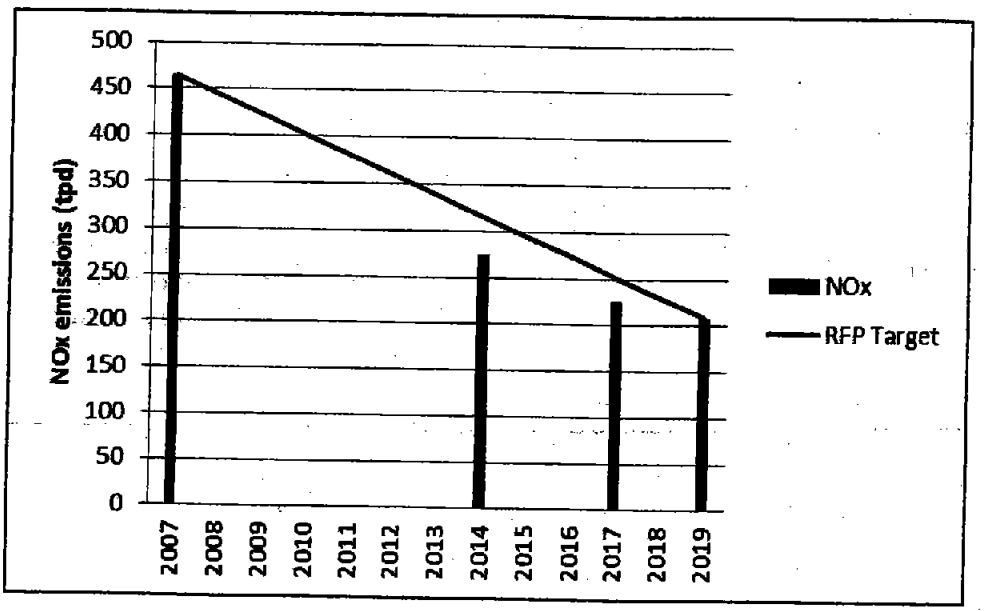
California's comprehensive mobile source program continues to be RACM as it expands and further reduces emissions. Given the significant emission reductions needed for attainment in California, ARB has adopted the most stringent control measures nationwide for on-road and off-road mobile sources and the fuels that power them. These measures provide a significant amount of emission reductions needed for the Valley to attain the PM2.5 standard. The complete RACM and RACT assessment is provided in Chapter 9 and Appendix D of the 2012 PM2.5 Plan.

C. Reasonable Further Progress

SIPs must also provide for steady progress in reducing emissions during the years leading to attainment. The pace of ARB and District control programs, as well as the early introduction of the District's wood burning and commercial cooking measures fully meets the RFP requirements. Figure 7 shows projected NOx emission levels along with

the RFP linear target. As shown in the figure, NOx emission levels are projected to be well below the level of required linear progress, ensuring early emission reductions towards attainment.

Figure 7. NOx emission reductions compared to RFP target.



D. Contingency Measures

Contingency measures provide additional emission reductions in the event a nonattainment area fails to achieve RFP targets or attain the PM2.5 standard by its attainment date. These contingency measures are to take effect without further ARB or District action. As shown above in the example in Figure 7, early reductions from the control strategy beyond those needed for RFP provide for interim year contingency. In addition, reductions that accrue between 2019 and 2020 provide the majority of the attainment contingency reductions. Additional Valleywide reductions from the commercial cooking and enhanced wood burning curtailment rules beyond those needed for localized attainment, as well as a contingency trigger in the residential wood burning rule provide the remaining contingency reductions. Additional discussion of contingency measures is provided in Chapter 9 of the 2012 PM2.5 Plan.

E. Transportation Conformity Budgets

Under section 176(c) of the Clean Air Act, transportation activities that receive federal funding or approval must be fully consistent with the SIP. U.S. EPA's transportation conformity rule[4] details requirements for establishing motor vehicle emission budgets (budgets) in SIPs for the purpose of ensuring the conformity of transportation plans and programs with the SIP.

[4] U.S. EPA maintains online information on its transportation conformity program, including access to relevant rulemakings, policy guidance, and reports at: http://www.epa.gov/otaq/transp/traqconf.htm

The 2012 PM2.5 Plan establishes county-level on-road motor vehicle emission budgets for each RFP milestone year, as well as for the attainment year. Emission budgets for direct PM2.5 and NOx were calculated using EMFAC2011 and reflect winter average emissions. The emission budgets established in the 2012 PM2.5 Plan fulfill the requirements of the Clean Air Act and U.S. EPA regulations to ensure that transportation projects will not interfere with progress and attainment of the annual PM2.5 standard. Additional detail on the on-road motor vehicle emission budgets can be found in Appendix C of the 2012 PM2.5 Plan.

V. ENVIRONMENTAL IMPACTS

To meet the requirements of the California Environmental Quality Act (CEQA), the District prepared a Draft Negative Declaration because the Initial Study showed there is no substantial evidence, in light of the whole record, that the 2012 PM2.5 Plan may have a significant effect on the environment. On November 8, 2012, the District issued a Notice of Intent to Adopt a Negative Declaration along with the Initial Study[5]. Comments on the Initial Study and Draft Negative Declaration were accepted from November 9, 2012 to December 8, 2012. The written comments received were reviewed and considered by the District Governing Board prior their adoption of the Final Negative Declaration and approval of the 2012 PM2.5 Plan at a public meeting held on December 20, 2012.

VI. STAFF RECOMMENDATION

ARB staff recommends that the Board:

1. Adopt the San Joaquin Valley 2012 PM2.5 Plan, including the emission inventory, local control strategy, attainment demonstration, identification of PM2.5 attainment plan precursors, attainment deadline request, reasonable further progress plan, contingency measures, RACT/RACM demonstration, and transportation conformity emission budgets, as revisions to the California SIP.

2. Direct the Executive Officer to submit the San Joaquin Valley 2012 PM2.5 Plan to U.S. EPA for approval.

[5] http://www.valleyair.org/notices/Docs/2012/11-18-12PM25/Notice_of_Intent-NegativeDeclaration.pdf

Appendix A

District Submittal Letter and Governing Board Resolution

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San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

December 26, 2012

Mr. James Goldstene
Executive Officer
California Air Resources Board
1001 "I" Street
P.O. Box 2815
Sacramento, CA 95812

Dear Mr. James Goldstene:

Enclosed is the State Implementation Plan (SIP) Package for the San Joaquin Valley Unified Air Pollution Control District (District) *2012 PM2.5 Plan*. The District Governing Board adopted the *2012 PM2.5 Plan* at a public hearing held on December 20, 2012. We request that the California Air Resources Board (ARB) transmit this plan and the appropriate documentation to the United States Environmental Protection Agency (EPA) as a SIP revision.

Included in this SIP Package are the following attachments:
1. ARB SIP Completeness Checklist
2. The *2012 PM2.5 Plan* with Appendices
3. Evidence of Public Hearing
4. Governing Board Resolution Adopting the *2012 PM2.5 Plan*
5. Governing Board Memo
6. CEQA Initial Study and Negative Declaration

If you have any questions regarding this plan, please contact Jessica Fierro by e-mail at Jessica.Fierro@valleyair.org or at (559) 230-5800. The District thanks you and your staff for your assistance.

Sincerely,

Samir Sheikh
Director of Strategies and Incentives

Attachments

cc: S. Vanderspek

**BEFORE THE GOVERNING BOARD OF THE
SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL DISTRICT**

**IN THE MATTER OF:
ADOPTING THE SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT *2012 PM2.5 PLAN***

RESOLUTION: 2012-12-19

WHEREAS, the San Joaquin Valley Unified Air Pollution Control District (District) is a duly constituted unified district, as provided in California Health and Safety Code sections 40150 to 40161; and

WHEREAS, pursuant to Section 107(d) of the federal Clean Air Act (CAA) as amended in 1990, the United States Environmental Protection Agency (EPA) has designated the San Joaquin Valley Air Basin (Valley) as nonattainment for the PM2.5 national ambient air quality standards (NAAQS) as set in 2006 in Volume 74, Number 218 of the *Federal Register* (pages 58688-781, effective December 14, 2009); and

WHEREAS, as given in Section 172(b) of the Clean Air Act (CAA), attainment plans must be submitted to EPA no later than three years after the effective date of the nonattainment designation; therefore, EPA requires the State of California to submit a plan by December 2012 that satisfies the requirements of Section 172 of the CAA, including a demonstration of attainment of the 2006 PM2.5 NAAQS in the Valley; and

WHEREAS, the initial attainment date for PM2.5 areas is no later than five years after the date of designation, or 2014, but the EPA Administrator may revise the date, as appropriate, for a period of up to ten years from the date of designation based on the availability and feasibility of control measures (40 CFR 51.1004 (a)); and

WHEREAS, the District Governing Board is committed to achieving the 2006 PM2.5 NAAQS, and the state PM2.5 standard, as expeditiously as possible; and

WHEREAS, the District Governing Board adopted Guiding Principles in February 2012 to provide an overall strategic direction for District staff in developing the *2012 PM2.5 Plan (Plan)*; and

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WHEREAS, the District developed the Plan through an extensive public process that included numerous meetings with the public, including public workshops in April, June, and October 2012, and the District responded to written and verbal comments that were received during associated comment periods; and

WHEREAS, the District uses extensive research and sound science as the foundation for the Plan; and

WHEREAS, photochemical and receptor modeling conducted by the District and the California Air Resources Board (ARB) show that emission reductions from the plan strategy are sufficient to demonstrate attainment by 2019, but not sooner; and

WHEREAS, the District conducted a comprehensive analysis of the emissions sources in the Valley and potential control measures to reduce emissions as expeditiously as practicable, given the feasibility of control technologies; and

WHEREAS, the Plan will bring the Valley into attainment by 2019, with a majority of Valley seeing attainment before 2019, and will achieve significant health benefits; and

WHEREAS, EPA's mass-based NAAQS do not fully address all public health factors, and the District prioritizes control strategies providing the greatest public health benefits under the District's Risk-Based Strategy; and

WHEREAS, the Plan will contribute to attainment of all EPA PM2.5 NAAQS; and

WHEREAS, the District, ARB, and the Valley's eight Metropolitan Planning Organizations (MPOs) prepared the Plan to demonstrate attainment of the 2006 PM2.5 NAAQS by 2019 and contain all elements required under the federal CAA; and

WHEREAS, the Plan includes sub-area mobile source emissions budgets for 2014, 2017, and 2019 that must be met by each of the eight MPOs, respectively, in the Valley for transportation conformity; and

WHEREAS, the dynamic nature of transportation planning in the Valley may trigger the need for technical refinements to the sub-area emissions budgets after the District Governing Board adoption of the Plan; and

WHEREAS, new and amended regulations to be adopted through implementation of

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the Plan would be subsequently developed through public processes, which will include due consideration of technological feasibility, cost-effectiveness, socioeconomic impact, and environmental impact; and

WHEREAS, individual control measures may be revised from what is proposed in the Plan, and the District is committed to achieving equivalent emission reductions from the overall control strategy in the same time frames as proposed in the Plan; and

WHEREAS, the technical PM2.5 modeling work supporting the Plan could not have been accomplished without the leadership, funding, and work products provided through the San Joaquin Valley-wide Air Pollution Study Agency; and

WHEREAS, the California Regional Particulate Air Quality Study (CRPAQS) will continue to produce results that help provide an improved understanding of PM in the Valley, including relationships among meteorology, atmospheric chemistry, and PM precursor emissions; and

WHEREAS, a public hearing for the adoption of the Plan was duly noticed and held on December 20, 2012, in accordance with law; and

WHEREAS, this Board concurs with the recommendations of its staff.

NOW, THEREFORE, be it resolved as follows:

1. The District Governing Board adopts the Proposed *2012 PM2.5 Plan*, thereby fulfilling air quality planning requirements under the federal CAA for the 2006 PM2.5 NAAQS. Said Plan is attached hereto and incorporated herein.

2. The District Governing Board requests EPA to set 2019 as the attainment date for the PM2.5 NAAQS, adopted in 2006.

3. Adoption of said Plan is necessary to comply with the federal CAA and will promote the health and welfare of the residents of the Valley.

4. The District has completed an Initial Study for said Plan that indicates the project will not result in any significant adverse effects to the environment, and a Proposed Negative Declaration has been prepared and properly noticed pursuant to the *California Environmental Quality Act (CEQA) Guidelines*. The District Governing

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Board has duly considered said Initial Study and proposed Negative Declaration. Accordingly, the District Governing Board approves and adopts a Negative Declaration for said Plan pursuant to CEQA requirements. In accordance with the provisions of Sections 15075 of the *CEQA Guidelines*, the Executive Director/Air Pollution Control Officer is hereby directed to file a Notice of Determination with the County Clerks of each county in the District.

5. The District Governing Board hereby finds, based on the evidence and information presented at the hearing upon which its decision is based, that all notices required to be given by law have been duly given, and that the District Governing Board has allowed public testimony in accordance with law.

6. District staff is directed to work with stakeholders and EPA to ensure that rules developed as a result of adoption of the Plan address technical and economic feasibility issues identified during plan development along with those that arise during the rule development process so that the rules are both fair and approvable by EPA.

7. The District Governing Board commits to adopt and implement the rules and measures in the Plan by the dates specified in Chapter 5 to achieve the emissions reductions shown in Chapter 5, and to submit these rules and measures to ARB within 30 days of adoption for transmittal to EPA as a revision to the State Implementation Plan (SIP). If the total emission reductions from the adopted rules are less than those committed to in the Plan, the District Governing Board commits to adopt, submit, and implement substitute rules and measures that will achieve equivalent reductions in emissions of direct PM2.5 or PM2.5 precursors in the same adoption and implementation timeframes or in the timeframes needed to meet CAA milestones.

7a. Reducing emissions from residential wood burning devices is prioritized under the District's Risk-Based Strategy.

7b. District staff is directed to amend Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters) ahead of the 2016 plan commitment, by winter

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2014. This early adoption is a local commitment, not a federally enforceable plan commitment.

7c. The 2014 amendments to Rule 4901 should allow for use of EPA-certified wood burning devices at certain curtailment levels. This will encourage residents to upgrade to these devices, helping to reduce emissions and improve public health even on days when wood burning is allowed.

8. Any technical refinements that are needed for the sub-area emissions budgets will be duly noticed and presented in the State strategy that is scheduled for hearing by ARB in January 2013.

9. The District Governing Board commits to provide adequate resources to carry out the provisions of the Plan.

10. The Executive Director/Air Pollution Control Officer is hereby directed to forward a copy of this Resolution, the Plan, and appropriate Appendices to the ARB for inclusion in the SIP.

11. The District Governing Board requests that ARB authorize its Executive Officer to include the District's *2012 PM2.5 Plan*, as adopted by the District's Governing Board, in the California SIP for submittal to EPA.

12. The District Governing Board requests that EPA approve the District's *2012 PM2.5 Plan*, including the rulemaking calendar and demonstrations of attainment, Reasonably Available Control Technology/Reasonably Available Control Measures (RACT/RACM), Reasonable Further Progress (RFP), contingency measures, and interpollutant trading ratios for New Source Review (NSR). The District Governing Board requests that EPA grant a conditional approval to any plan elements for which EPA cannot, for whatever reason, grant full approval at this time.

13. District staff is hereby authorized to make any minor typographical and technical changes in the Plan that are necessary to correct minor errors, clarify wording, or to satisfy ARB and EPA technical requirements, provided that there are no changes in the conclusions or control requirements in the Plan.

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14. **THE FOREGOING** was passed and adopted by the following vote of the Governing Board of the San Joaquin Valley Unified Air Pollution Control District this 20th day of December 2012, to wit:

AYES: Barba, Barwick, Bomprezzi, Case, Dominici, Hanson, Ornellas, Sherriffs, Walsh, Worthley, Vierra, Watson, O'Brien

NOES: None

ABSENT: Baines, Forman

SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL DISTRICT

By _____
William O'Brien, Chair
Governing Board

ATTEST:
Deputy Clerk of the Governing Board

By _____
Michelle Franco

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Appendix B

Weight of Evidence Analysis

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SAN JOAQUIN VALLEY PM2.5 WEIGHT OF EVIDENCE ANALYSIS

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EXECUTIVE SUMMARY

The San Joaquin Valley 2012 PM2.5 Plan demonstrates that the San Joaquin Valley will attain the PM2.5 24-hour standard of 35 ug/m^3 as expeditiously as practicable due to adopted and proposed control measures. As part of the attainment demonstration, the 2012 PM2.5 Plan specifically identifies the: 1) most expeditious date of when the San Joaquin Valley (Valley) will attain the standard, 2) attainment plan precursors, 3) amount of emissions needed to attain, and 4) sources to control. The weight of evidence analysis provides a set of complementary analyses that supplement the required modeling. Because all methods have strengths and weaknesses, examining an air quality problem in a variety of ways offsets the limitations and uncertainty that are inherent in air quality modeling. This approach also provides a better understanding of the overall problem and the level and mix of emissions controls needed for attainment.

Analyses conducted by Air Resources Board (ARB) and San Joaquin Valley Air Pollution Control District (SJVAPCD or District) staff, along with findings from the California Regional Particulate Air Quality Study (CRPAQS) provide the supplemental information supporting the attainment demonstration. CRPAQS was a public/private partnership designed to advance our understanding of the nature of PM2.5 in the Valley and guide development of effective control strategies. The study included monitoring at over 100 sites as well as data analysis and modeling, results of which have been published in over 60 papers and presented at national and international conferences.

Studies such as CRPAQS provide valuable information that supports the State Implementation Plan (SIP) process in a number of ways. First, these studies provide additional observational data that help to provide a more detailed understanding of the nature of the PM2.5 problem in the San Joaquin Valley. This data also is used to update the fundamental algorithms contained within air quality models, thereby enhancing their ability to simulate observed air quality conditions. Finally, they provide an improved basis for model applications used in the preparation of SIPs and a more robust platform for evaluating the response to emission controls and predicting future air quality.

What is the nature of the 24-hour PM2.5 problem in the Valley?

The geography of the San Joaquin Valley, along with weather patterns influence the accumulation, formation, and dispersion of PM2.5. As a result, PM2.5 concentrations are generally higher in the central and southern portions of the Valley, with highest values in the urban areas of Fresno and Bakersfield. Concentrations are highest during the winter months of November through February. During these months, high-pressure weather systems over Northern California can cause the atmosphere to become stagnant for extended periods, resulting in PM2.5 episodes that can persist from several days up to several weeks.

Ammonium nitrate and carbonaceous material (organic and elemental carbon) are the largest constituents of PM2.5 on exceedance days, comprising 85 to 90 percent of the

mass. Geological material (dust), and ammonium sulfate are small contributors. Ammonium nitrate is formed in the atmosphere from reactions of gaseous precursors. Emissions of nitrogen oxides (NOx) from mobile sources and stationary sources react with ammonia which is primarily emitted from livestock operations, fertilizer application, and mobile sources. The stagnant, cold, and damp conditions that occur during the winter promote the formation and accumulation of ammonium nitrate. Elevated concentrations can be found at both urban and rural sites. In contrast, organic carbon is highest in urban areas due to emissions from residential wood combustion, commercial cooking operations, and mobile source tailpipe emissions which are largest in urban areas. Due to the localized urban increment from these activities, which adds to the more regional ammonium nitrate concentrations, the highest PM2.5 concentrations in the Valley occur at urban sites.

What progress has been made in reducing PM2.5 concentrations?

The Valley has experienced progress in reducing both annual average and 24-hour PM2.5 concentrations over the last ten years. Between 2001 and 2011, annual average design values in the Valley declined between 30 and 40 percent at individual monitoring locations. Overall, annual PM2.5 trends adjusted for the effects of meteorology indicate that between 1999 and 2010, annual PM2.5 concentrations decreased about 40 to 50 percent at Bakersfield and Fresno due to emission reductions. With on-going implementation of the 2008 PM2.5 Plan, annual average PM2.5 concentrations in the Valley are expected to continue to improve and reach attainment in 2014.

During this same time period, 24-hour PM2.5 design values in the Valley have also decreased between approximately 30 and 50 percent. In addition, the number of days exceeding the 24-hour standard decreased by about 45 to 50 percent. After adjusting for the influence of meteorology, the number of exceedance days has decreased between 60 and 65 percent in Bakersfield and Fresno.

Additional evaluations provide further insight into the annual and 24-hour PM2.5 progress that has been observed. For example, as the fraction of days recording PM2.5 levels above the 24-hour standard has decreased, there has been a corresponding increase in the fraction of days below the level of the annual standard of 15 ug/m^3. Average concentrations during the winter months have decreased, and under similar meteorological conditions, peak 24-hour concentrations during episodes are now 40 percent lower than they were ten years ago.

What are the attainment plan precursors?

Ambient PM2.5 is comprised of many different constituents and as a result there are multiple precursor pollutants that lead to PM2.5 formation (directly emitted PM2.5, NOx, sulfur oxides (SOx), volatile organic compounds (VOCs), and ammonia). The U.S. Environmental Protection Agency's (U.S. EPA) PM2.5 implementation rule specifies that a precursor is considered "significant" for control strategy development purposes when a significant reduction in the emissions of that precursor pollutant leads to a significant decrease in PM2.5 concentrations. Such pollutants are known as

"PM2.5 attainment plan precursors" (72 FR 20586). The PM2.5 implementation rule also establishes a presumption that PM2.5, NOx, and SOx are attainment plan precursors, while VOCs and ammonia are not. For the annual PM2.5 plan, PM2.5, NOx, and SOx were identified and approved as the only attainment plan precursors by U.S. EPA.

Given the large contribution of ammonium nitrate on 24-hour PM2.5 exceedance days, a number of different studies and analyses were evaluated to understand the role of VOCs and ammonia in ammonium nitrate formation in the San Joaquin Valley and to determine whether they should be considered attainment plan precursors for the 2012 24-hour PM2.5 Plan. The amount of ammonium nitrate produced depends upon the relative atmospheric abundance of its precursors. It is therefore important to understand which precursor controls are most effective in reducing ammonium nitrate concentrations. In simple terms, the precursor in shortest supply will limit how much ammonium nitrate is produced. This is known as the limiting precursor and controls of this precursor will have the most significant benefits in reducing PM2.5 concentrations.

The precursor assessment for the 24-hour PM2.5 plan included evaluation of emissions inventories, monitoring studies, and photochemical modeling analyses of ammonium nitrate sensitivity to precursor emission reductions. While emissions inventory and monitoring data can indicate the relative abundance of the different precursors, photochemical models provide a quantitative approach to simulate the effects that emission reductions in each of gaseous precursors would have on the predicted ammonium nitrate concentrations.

Evaluation of both emissions inventory and monitoring data concluded that the ammonia-rich conditions throughout the Valley demonstrate that NOx rather than ammonia is the limiting precursor during wintertime PM2.5 episodes. In addition, photochemical modeling studies found that while large reductions in NOx led to commensurate reductions in ammonium nitrate, comparable reductions in ammonia were much less effective. Precursor sensitivity modeling conducted for the 2012 PM2.5 Plan showed that on a per ton basis, reductions in NOx are approximately nine times more effective than reductions in ammonia. Finally, evaluation of ambient air quality trends show that reductions in NOx emissions, gaseous NOx concentrations, and particulate nitrate all track each other well.

Evaluation of monitoring studies also provided some evidence that VOCs could be important at times, however these studies were not conclusive. Therefore photochemical modeling studies are more appropriate to assess the overall impact of VOC controls. These modeling studies found that at current NOx levels, further VOC emission reductions produce essentially no benefit, and in some instances may actually lead to an increase in ammonium nitrate concentrations. Findings from these prior studies were supported by precursor sensitivity modeling conducted for the 2012 PM2.5 SIP, which indicated a very small disbenefit from reductions in VOCs.

As noted previously, U.S. EPA's PM2.5 implementation rule directs SIP planning efforts and regulation to those pollutants generally known to significantly contribute to PM2.5 concentrations. Based on the weight of evidence presented from historical studies, coupled with the modeled precursor sensitivity analyses conducted as part of the 2012 PM2.5 Plan, VOCs and ammonia are not considered significant precursors for 24-hour PM2.5. Therefore the 2012 24-hour PM2.5 plan attainment precursors are directly emitted PM2.5, NOx, and SOx.

When will the Valley attain the 24-hour PM2.5 standard?

Consistent with U.S. EPA guidelines, air quality modeling was done to predict future PM2.5 concentrations at each monitoring site in the San Joaquin Valley. This modeling shows attainment of the 24-hour PM2.5 standard by 2019 in all counties except Kings and Kern, based on implementation of the ongoing control program. In these counties, additional focused emission reductions are needed to provide for attainment. The modeling analysis includes new emission reductions each year between now and 2019 from implementation of a combination of adopted ARB and District programs. As a result, most sites in the northern and central Valley are expected to attain prior to 2019.

ARB staff then modeled a scenario with an enhanced wood burning curtailment program Valley wide, which would be designed to prevent wood burning on days that may lead up to a PM2.5 exceedance. The predicted design values for each site from this modeling scenario are shown in Table E-1.

Table E-1.

2019 Modeled 24-hour PM2.5 Design Values with Enhanced Residential Wood Burning Curtailment Program.

Monitoring Site	Design Value ($\mu g/m^3$)
Bakersfield - California	35.7
Bakersfield - Planz	32.9
Corcoran - Patterson	32.1
Visalia - N. Church	29.4
Fresno - Hamilton	28.6
Fresno - First	30.5
Clovis	28.6
Merced	22.6
Modesto	24.7
Stockton	21.4

While adoption of a more stringent wood burning curtailment program brings the Bakersfield-California site very near attainment, further reductions are still needed and will be provided through a measure to achieve additional emission reductions from commercial cooking operations. Design values at all other sites are well below attainment levels.

What is the attainment control strategy?

In order to determine the emission reductions needed to bring Bakersfield into attainment, ARB staff conducted additional modeling sensitivity runs to assess the relative efficacy of further reductions of different PM2.5 precursors. The current 24-hour PM2.5 standard modeling demonstrates that on a relative basis the greatest benefits are achieved from reductions in sources of directly emitted PM2.5, followed by NOx, based on U.S. EPA's relative response factor procedures. Kern County specific model sensitivity runs were also conducted to evaluate the benefits of emission reductions focused on the Bakersfield area. These runs show that directly emitted PM2.5 emission reductions are approximately 8 times more effective than NOx reductions.

The implementation of new reductions from California's on-going emission control programs will provide the majority of the emission reductions needed to attain the 24-hour PM2.5 standard throughout the San Joaquin Valley in 2019. The PM2.5 design value at the Bakersfield-California site must decrease by approximately 45 percent to demonstrate attainment. Between 2007, the base year used in the photochemical modeling attainment demonstration and 2019, implementation of these control programs will reduce NOx emissions by 55 percent. The weight of evidence analysis has demonstrated that prior reductions in NOx have resulted in commensurate reductions in ambient concentrations of nitrate. This is consistent with modeled predictions that demonstrate a nearly 50 percent reduction in ammonium nitrate concentrations.

In addition, while directly emitted PM2.5 emissions in aggregate are decreasing by nearly 30 percent, a major focus of the attainment control strategy is further curtailment of residential wood burning, along with implementation of a measure to reduce emissions from commercial cooking. District analysis has demonstrated the significant benefits of past implementation of wood burning curtailment. Further, examination of emission sources surrounding the Bakersfield-California monitor, and a modeling sensitivity run support the benefits of reducing emissions from cooking operations. The final attainment demonstration for the Bakersfield-California design site is provided in Table E-2.

Table E-2.

Attainment Demonstration for the Bakersfield-California Design Value Site.

2007 Design Value (ug/m3)	2019 Design Value with Wood Burning Program Enhancement (ug/m3)	2019 Final Design Value (ug/m3)
65.6	35.7	≤35.4

Note: The benchmark for attainment is a design value that is equal to or less than 35.4 µg/m^3.

Consideration of the entirety of information presented in the weight of evidence provides a consistent assessment that supports the modeled attainment date of 2019. The substantial continuing reductions that will result from implementation of the ongoing control program, coupled with new measures addressing residential wood burning and cooking, are consistent with the results predicted in the modeled attainment demonstration.

1. INTRODUCTION

The 2012 PM2.5 Plan demonstrates that the San Joaquin Valley will attain the PM2.5 24-hour standard as expeditiously as practicable due to adopted and proposed control measures. As part of the attainment demonstration, the 2012 PM2.5 Plan specifically identifies the: 1) most expeditious date for when the San Joaquin Valley (SJV or Valley) will attain the standard, 2) attainment plan precursors, 3) amount of emissions needed to attain, and 4) sources to control.

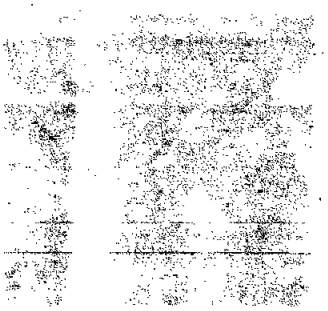
Following U.S. Environmental Protection Agency (U.S. EPA) guidance and procedures, the attainment demonstration was conducted through a modeled attainment test. Photochemical modeling was used to identify the most expeditious attainment date, the relative benefits of controlling different PM2.5 precursor pollutants, and the magnitude of emission reductions needed from each pollutant. The Weight of Evidence (WOE) analysis provides a set of complementary analyses that supplement the required modeling.

A WOE approach looks at the entirety of the information at hand to provide a more informed basis for the attainment strategy. Because all methods have strengths and weaknesses, examining an air quality problem in a variety of ways offsets the limitations and uncertainty that are inherent in air quality modeling. This approach also provides a better understanding of the overall problem and the level and mix of emissions controls needed for attainment.

The U.S. EPA recognizes the importance of a comprehensive assessment of air quality data and modeling and encourages this type of broad assessment for all attainment demonstrations. In their modeling guidance, they further note that the results of supplementary analyses may be used in a WOE determination to show that attainment is likely despite modeled results which may be inconclusive (U.S. EPA 2007). Following the U.S. EPA guidance, future year modeled 24-hour design values that fall between 32 and 37 ug/m^3 need to be accompanied by a WOE demonstration to determine whether attainment will occur. This range in modeled design values reflects the uncertainty in predicting absolute PM2.5 concentrations that is inherent in air quality modeling, and therefore recognizes that an improved assessment of attainment can be derived from examining a broader set of analyses.

U.S. EPA recommends that three basic types of analyses be included to supplement the primary modeling analysis in the WOE approach: 1) analyses of trends in ambient air quality and emissions, 2) observational models and diagnostic analyses, and 3) additional modeling evaluations. The scope of the WOE analysis is different for each nonattainment area. The level of detail appropriate for each area depends upon the complexity of the air quality problem, how far into the future the attainment deadline is, and the amount of data and modeling available. For example, less analysis is needed for an area that is projecting attainment near-term and by a wide margin, and for which recent air quality trends have demonstrated significant progress, than for areas with more severe air quality challenges

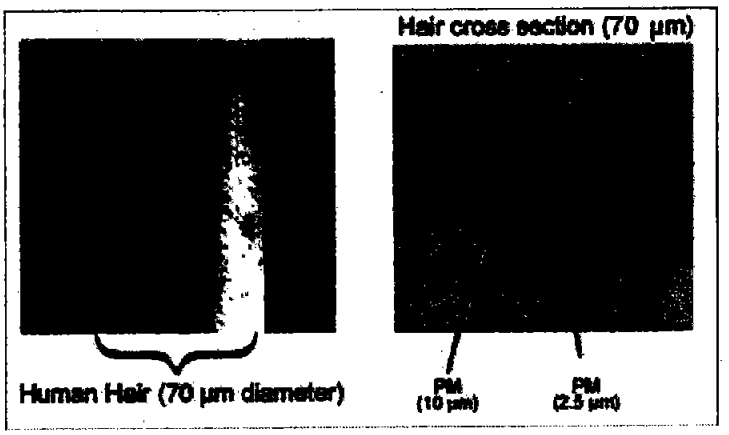
The following sections present the WOE assessment that supports the attainment demonstration the 24-hour PM2.5 standard in the San Joaquin Valley.



2. PM2.5 STANDARDS AND HEALTH EFFECTS

PM2.5 is a complex mixture of particles and liquid droplets that vary in size and chemical composition. As a subset of PM10, particles with diameters up to 10 micrometers, PM2.5 comprises particles with diameters up to 2.5 micrometers (Figure 1). PM2.5 contains a diverse set of substances including elements such as carbon and metals, compounds such as nitrates, sulfates, and organic materials, and complex mixtures such as diesel exhaust and soil or dust. Some of the particles are directly emitted into the atmosphere. Others, referred to as secondary particles, result when gases are transformed into particles through physical and chemical processes in the atmosphere.

Figure 1. PM2.5 particle diameter compared to the thickness of a single strand of hair.



Numerous health effects studies have linked exposure to PM2.5 to increased severity of asthma attacks, development of chronic bronchitis, decreased lung function in children, increased respiratory and cardiovascular hospitalizations, and even premature death in people with existing cardiac or respiratory disease. In addition, California has identified particulate exhaust from diesel engines as a toxic air contaminant – suspected to cause cancer, other serious illnesses, and premature death. Those most sensitive to PM2.5 pollution include people with existing respiratory and cardiac problems, children, and older adults.

Ambient air quality standards establish the levels above which PM2.5 may cause adverse health effects. In 1997, U.S. EPA adopted the first set of PM2.5 air quality standards, an annual standard of 15 $\mu g/m^3$ and a 24-hour standard of 65 $\mu g/m^3$. To address the 1997 PM2.5 standards, the San Joaquin Valley Air Pollution Control District (SJVAPCD or District) adopted the 2008 PM2.5 Plan. At the time of plan development, the San Joaquin Valley already attained the 24-hour standard, thus the 2008 PM2.5 Plan focused on the annual PM2.5 standard. U.S. EPA approved this Plan in 2011 (76 FR 41338; 76 FR 69896). In 2006, U.S. EPA tightened the 24-hour standard to 35 $\mu g/m^3$. Attainment of this standard is the focus of the SJV 2012 PM2.5 Plan.

3. MONITORING IN THE SAN JOAQUIN VALLEY

a. Established monitoring network

An extensive network of PM2.5 monitors throughout the SJV provides data to assess compliance with ambient air quality standards and to study the nature of ambient PM2.5. Currently, the network comprises 21 monitoring sites. Many sites include multiple monitoring instruments running in parallel. Seven sites operate Federal Reference Monitors (FRMs), which provide regulatory data that are used to assess compliance with the federal PM2.5 standards. An additional 20 monitors provide hourly PM2.5 measurements. Eleven of these continuous monitors are Federal Equivalent Monitors (FEM), which can also be used to assess compliance with the standards. The FRM and FEM monitoring sites are shown in Figure 2. The locations of these monitors are designed to capture population exposure. In addition, data collected at these monitors serve to report air quality conditions to the public, and support forecasting for the District's agricultural and residential burning curtailment programs. Finally, four sites have chemical speciation monitors. The speciation monitors collect samples that are further analyzed in the laboratory to determine the chemical make-up of PM2.5.

Figure 2. San Joaquin Valley PM2.5 monitoring network (FRMs and FEMs, October 2012).

b. Extensive field studies

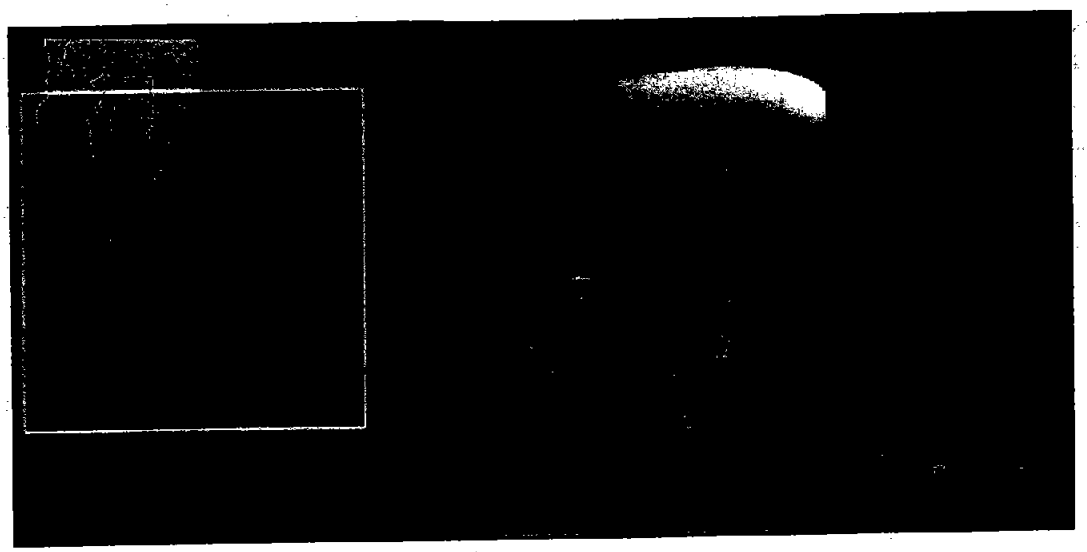
The San Joaquin Valley is one of the most studied areas in the world with an extensive number of publications in peer-reviewed international scientific/technical journals and other major reports. Since 1970, close to 20 major field studies have been conducted in the Valley and surrounding areas that have elucidated various aspects of the nature and

causes of ozone and particulate matter. A comprehensive listing of publications (reports and peer-reviewed journal articles) is provided in Appendix 1.

The first major study specifically focused on particulate matter was the Integrated Monitoring Study in 1995 (IMS-95), which was the pilot study for the subsequent California Regional Particulates Air Quality Study (CRPAQS) in 2000 (Solomon and Magliano, 1998). IMS-95 formed the technical basis for the SJV 2003 PM10 Plan that was approved by the U.S. EPA in 2004 (71 FR 63642), and the Valley was subsequently re-designated as attainment in 2008 (73 FR 66759). CRPAQS was a key component of the technical foundation for the SJV 2008 PM2.5 Plan that U.S. EPA approved in 2011 (76 FR 41338; 76 FR 69896). Although conducted more than ten years ago, CRPAQS findings remain relevant to the development of the current 24-hour PM2.5 Plan.

CRPAQS was a public/private partnership designed to advance the understanding of the nature of PM2.5 in the Valley and guide development of effective control strategies. The study included monitoring at over 100 sites (Figure 3) as well as data analysis and modeling, results of which have been published in over 60 papers and presented at national and international conferences. The field campaign was carried out between December 1999 and February 2001. CRPAQS improved our understanding of the spatial and temporal distribution of PM2.5 in the Valley, its chemical composition, transport and transformation processes, and contributing sources. More details on CRPAQS can be found at the following link: http://www.arb.ca.gov/airways/ccaqs.htm.

Figure 3. CRPAQS monitoring program.



Findings from CRPAQS and other studies have been integrated into the conceptual model of PM2.5 in the San Joaquin Valley. The conceptual model provides the scientific foundation for the WOE analysis supporting the 24-hour PM2.5 standard attainment demonstration. Specific findings are integrated into the various WOE analysis sections of this document.

Further field studies relevant to PM2.5 include the California portion of the Arctic Research of the Composition of the Troposphere (ARCTAS-CARB) which took place in 2008 (Jacob, et al., 2010) and Research at the Nexus of Air Quality and Climate (CalNex2010) conducted in 2010 (www.esrl.noaa.gov/csd/calnex/). The monitoring operations for both studies occurred during the early to mid-summer and extended over Southern California and the Central Valley. Some study findings have been published (e.g., Kaduwela and Cai, 2009, Cai and Kaduwela, 2011, Kelly et al., 2011), but data analysis is still in progress.

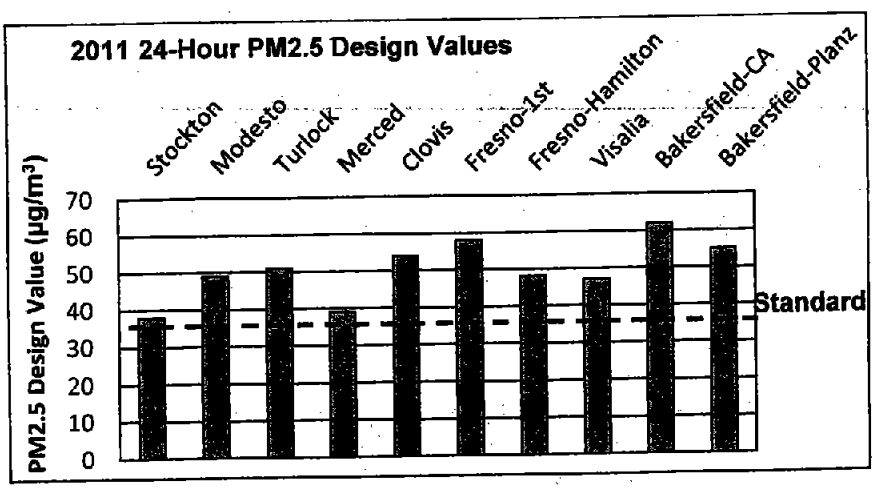
4. NATURE AND EXTENT OF THE PM2.5 PROBLEM

a. Current air quality

The geography of the San Joaquin Valley, along with large-scale regional and local weather patterns, influence the accumulation, formation and, dispersion of air pollutants. Covering nearly 25,000 square miles, the Valley is a lowland area bordered by the Sierra Nevada Mountains to the east, the Pacific Coast range to the west, and the Tehachapi Mountains to the south. The mountains act as air flow barriers, with the resulting stagnant conditions favoring the accumulation of pollutants. To the north, the Valley borders the Sacramento Valley and Delta lowland, which allows for some level of pollutant dispersion. As a result of geography and meteorology, PM2.5 concentrations are generally higher in the southern and central portions of the Valley.

To determine attainment for the 24-hour standard, the design value at each monitoring site must be calculated following strict U.S.EPA protocols. The design value represents a three-year average of the 98th percentile of the measured PM2.5 concentrations. Depending on a site's 24-hour PM2.5 data collection schedule, the 98th percentile usually corresponds to a value between the 2nd and the 8th highest value. If the design value is equal to or below 35.4 µg/m^3, the site attains the standard. Figure 4 shows the 2011 24-hour PM2.5 design values throughout the San Joaquin Valley. All sites currently record design values above the standard, although design values are generally lower in the northern and central Valley. Urban sites in the Fresno and Bakersfield areas register the higher design values.

Figure 4. 2011 24-hour design values

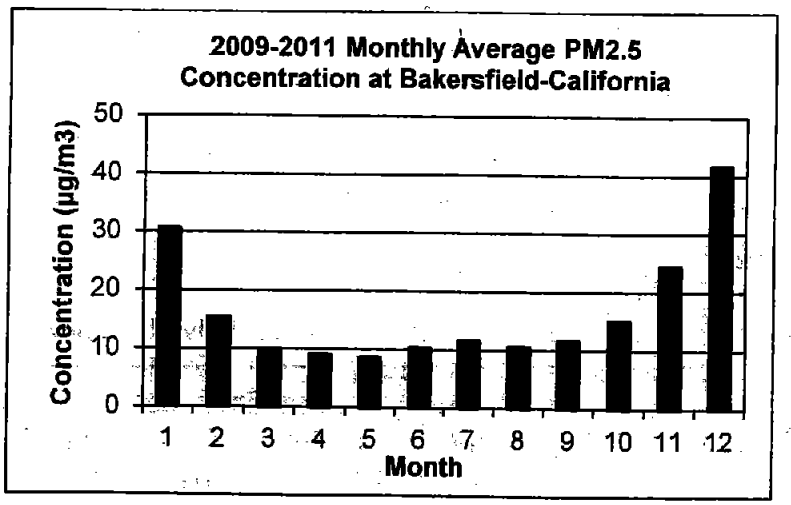


b. Seasonal variability

PM2.5 concentrations in the San Joaquin Valley exhibit a strong seasonal pattern, with highest concentrations occurring from November through February (Figure 5). During the winter, PM2.5 builds up over several days or weeks. These PM2.5 episodes are caused by increased activity in some emission sources and by meteorological

conditions that are conducive to the build-up and formation of PM2.5. During the winter, high-pressure weather systems over California can cause the atmosphere to become stagnant for extended periods leading to temperature inversions. Under normal conditions, temperature decreases with altitude, allowing free upward air flow and dispersing emissions and pollutants. In contrast, a temperature inversion positions a layer of warmer air above cooler air, impeding upward flow of emissions and air pollutants. Often the inversion layer is lower than the mountains surrounding the Valley, trapping emissions and pollutants.

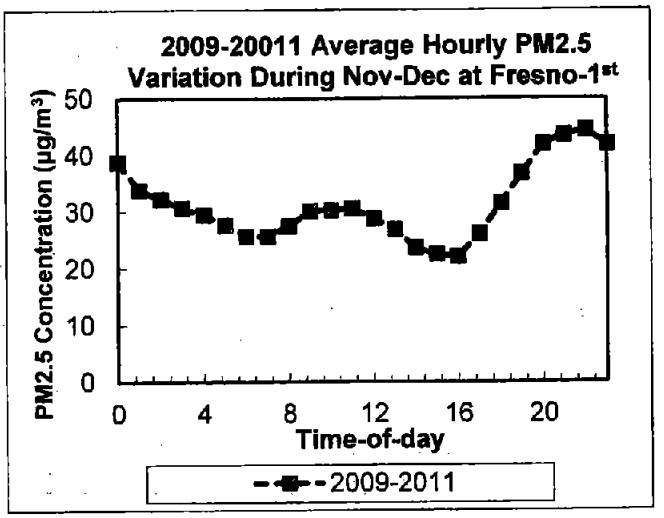
Figure 5. Seasonal variation in PM2.5 concentrations at Bakersfield-California.



c. Diurnal variability

During the winter, PM2.5 levels in the San Joaquin Valley also vary significantly across the 24-hour period. For example, in urban Fresno, the highest PM2.5 concentrations occur during the night (Figure 6). Peak evening concentrations generally reflect the influence of lowering inversion heights which trap pollutants close to the surface, as well as increased activity from evening commute traffic and residential wood combustion. The smaller peak of PM2.5 concentrations observed during mid-day is due in part to traffic activity, but mostly reflects secondary pollutant formation and PM2.5 formed above the inversion layer from previous day's emissions that mix back to the surface during the day.

Figure 6. Variation in hourly PM2.5 concentrations during the winter at Fresno-1st.



d. Chemical composition

Examination of the chemical make-up of PM2.5 on days exceeding the daily standard provides another important element in understanding the nature of PM2.5 in the Valley and contributing sources. The pie charts in Figure 7 show the current chemical components that contribute to PM2.5 on days that exceed the standard at urban sites in the southern (Bakersfield), central (Fresno), and northern (Modesto) regions of the Valley. These sites currently record the highest PM2.5 concentrations in their corresponding regions. While the relative percentages vary, in all cases the major components are ammonium nitrate and organic material (organic carbon).

Ammonium nitrate is the largest contributor to PM2.5, especially in the southern region. At Bakersfield, ammonium nitrate constitutes about 65 percent of PM2.5, while at Fresno and Modesto it constitutes about 55 percent. Ammonium nitrate is formed in the atmosphere from chemical reactions of NOx and ammonia. Sources emitting NOx include motor vehicles and stationary combustion sources. The largest sources of ammonia are livestock operations, fertilizer application, and mobile. The stagnant, cold, and damp conditions that occur during the winter promote the formation and accumulation of ammonium nitrate. Additional information on ammonium nitrate formation can be found in section 5.

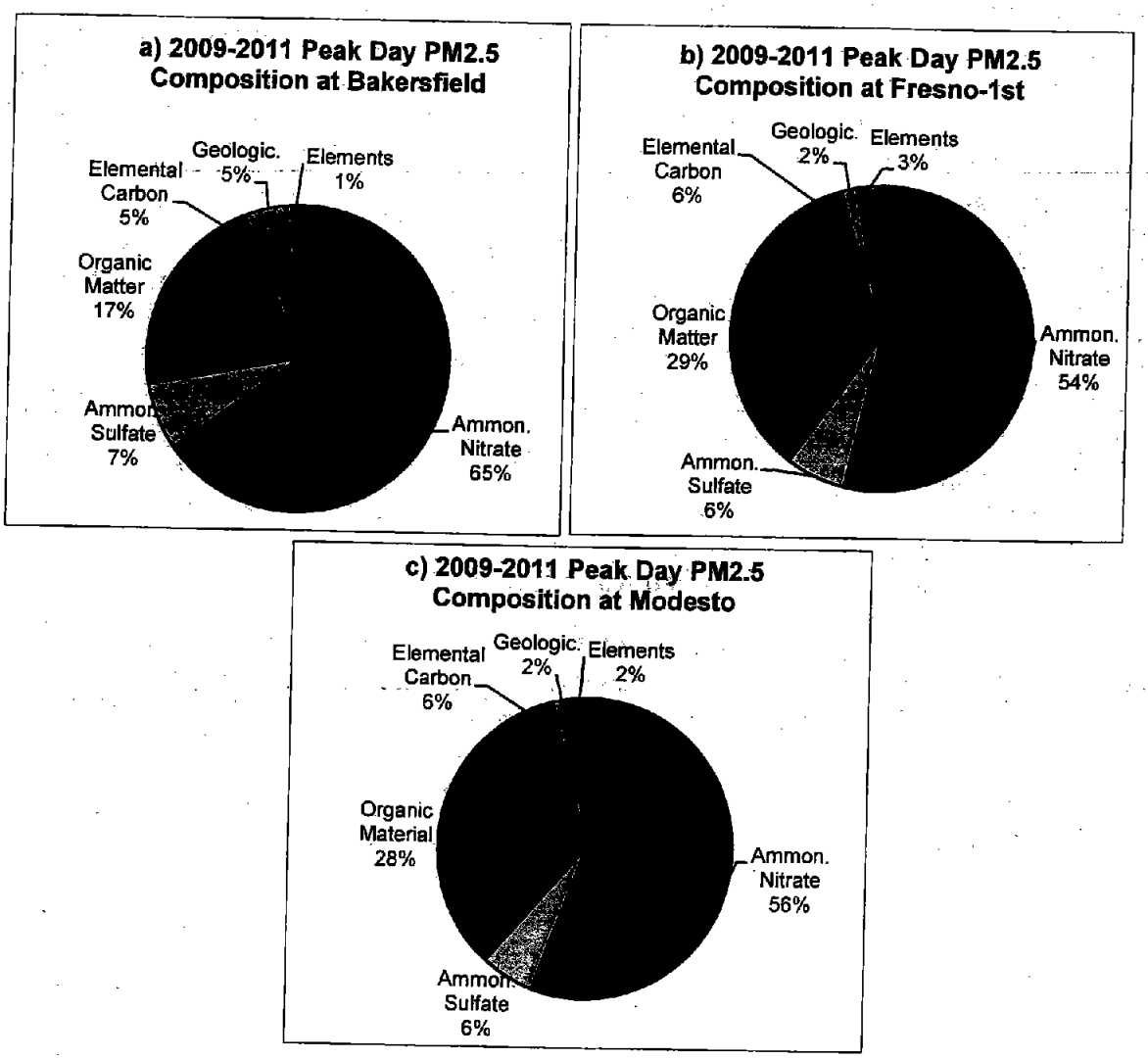
The organic matter component of PM2.5 is largest in the central and northern portions of the Valley. Organic matter constitutes about 30 percent of PM2.5 at Modesto and Fresno compared to less than 20 percent at Bakersfield. Activities such as residential wood combustion, cooking, biomass burning, and direct tailpipe emissions from mobile sources contribute to the PM2.5 organic matter component.

Ammonium sulfate and elemental carbon each contribute about five percent at the three sites. Ammonium sulfate is also formed in the atmosphere from SOx emitted from

combustion sources. Elemental carbon results from mobile and stationary combustion sources, with significant contributions from diesel sources.

Geological material contributes to a lesser extent, about five percent at Bakersfield and about two percent at Modesto and Fresno. Geological material comes from dust suspended into the air by vehicle travel on roads, soil from agricultural activities, and other dust producing activities such as construction.

Figure 7. 2009-2011 average peak day PM2.5 chemical composition at a) Bakersfield, b) Fresno, and c) Modesto.



e. Spatial distribution of the major PM2.5 components; local versus regional

As noted previously, high PM2.5 concentrations in the Valley occur almost exclusively during multiday pollution episodes under stagnant winter weather conditions. The duration and strength of an episode depends on atmospheric stability, but episodes can last several weeks. Once the weather conditions conducive to an episode set in, PM2.5 concentrations increase due to the accumulation of primary pollutants and formation of secondary pollutants.

Each episode has a regional as well as local component (Turkiewicz et al., 2006). High concentrations of nitrate can occur over large regions, including both urban and rural areas (Figure 8). As shown in Figure 9, ammonia is mostly concentrated in rural areas, particularly between Fresno and Bakersfield. On the other hand, high concentrations of organic carbon are more localized around urban sites, especially Fresno, with lower concentrations at rural sites (Figure 10).

The differences between the regional and local component can be traced back to the emission sources and subsequent formation and transport processes for each chemical component. Gaseous precursors of ammonium nitrate (NOx and ammonia) are transported much more efficiently than directly emitted organic matter particles (Ying and Kleeman, 2009). Although, some of the emitted NOx forms ammonium nitrate in urban areas, it is also transported to downwind regions where it reacts with ammonia to form particulate ammonium nitrate in the rural areas. While transport does occur, the distances are still relatively limited, with transport distances of 50 to 60 kilometers in the central and southern Valley. Ying et.al. (2009) found for example that most of the PM2.5 nitrate in Bakersfield is produced from sources within the southern Valley.

In contrast, carbonaceous aerosols are emitted into the atmosphere as particles and have a shorter lifetime due to higher deposition rates. Under stagnant conditions they can only be transported a short distance and therefore, have the greatest impact locally. Transport distances for carbonaceous aerosols during CRPAQS were only 20 to 40 kilometers. Due to this localized organic carbon increment, which adds to the more regional ammonium nitrate concentrations, the highest PM2.5 concentrations occur at urban sites.

Figure 8. Spatial distribution of winter ammonium nitrate concentrations measured during CRPAQS (Chow et al., 2005).

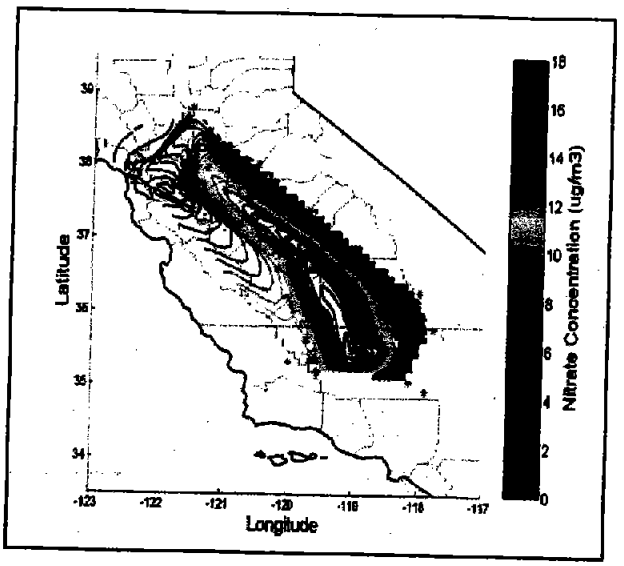


Figure 9. Spatial distribution of annual ammonia (NH_3) concentrations (2/1/2000-1/31/2001) during CRPAQS (Chow et al., 2005).

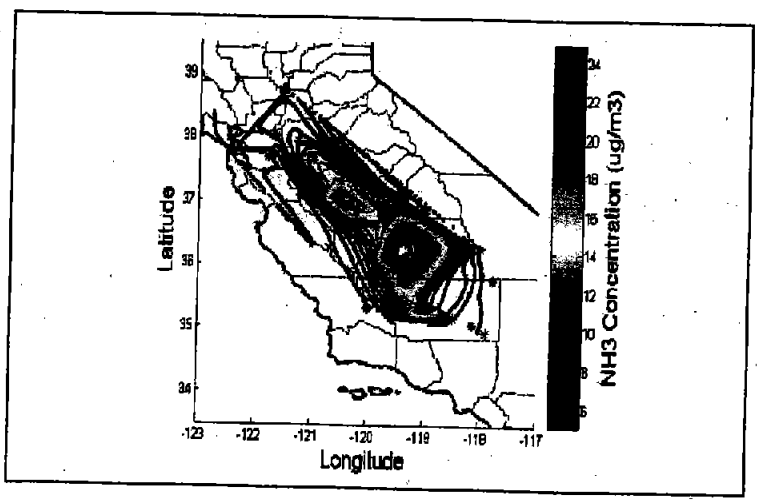
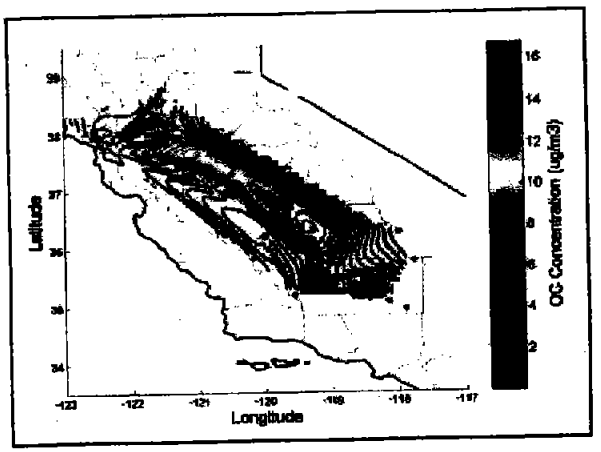


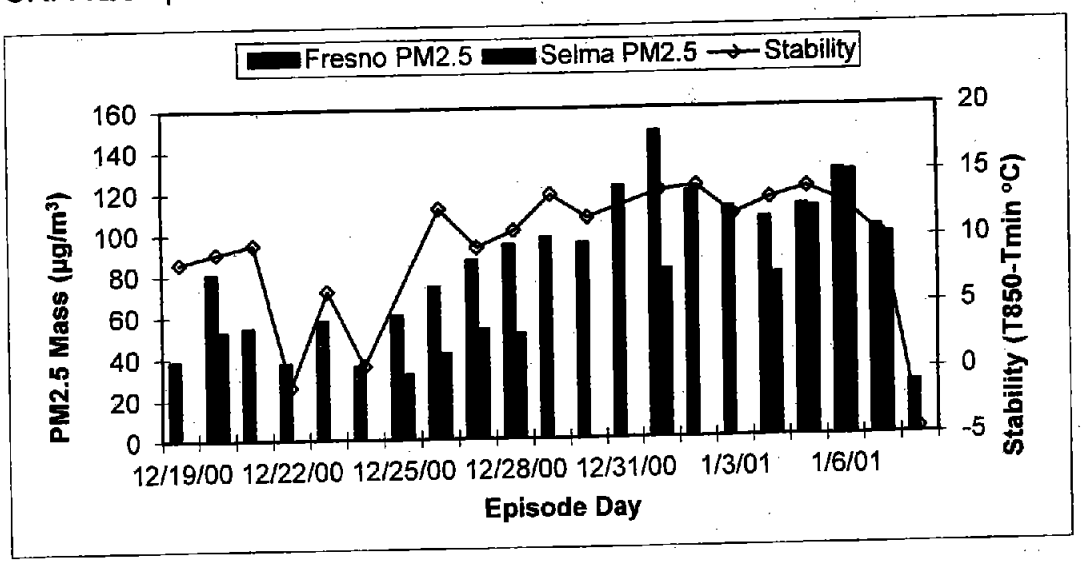
Figure 10. Spatial distribution of winter organic carbon concentration measured during CRPAQS (Chow et al., 2005).



f. Episode development

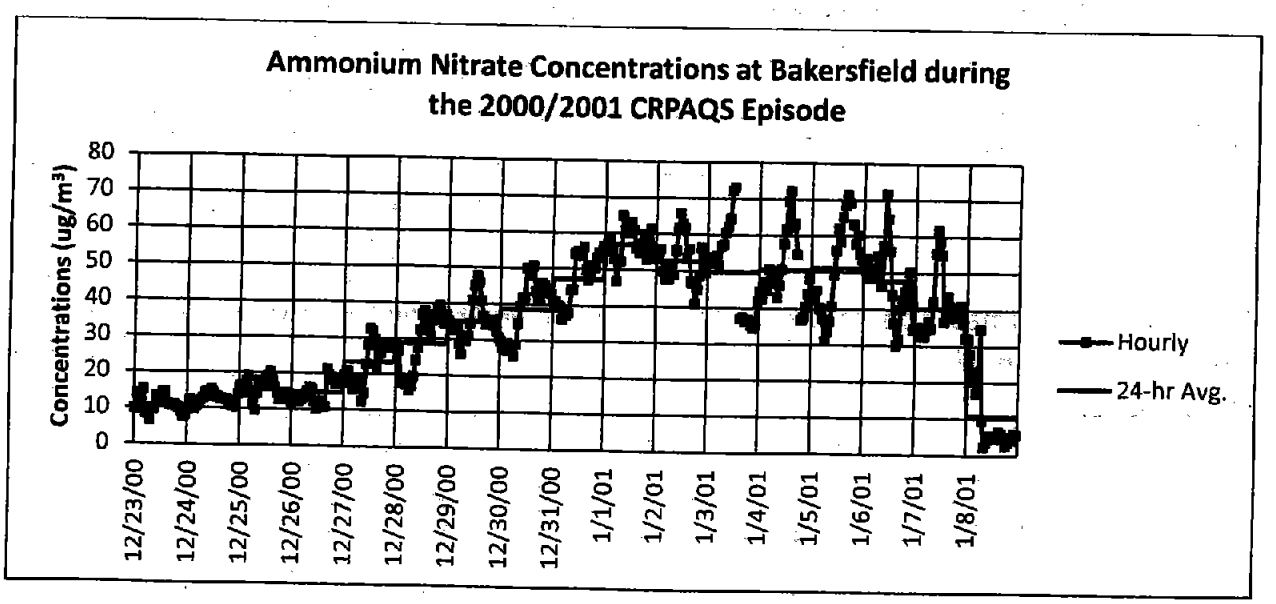
The development of PM2.5 episodes in the Valley is strongly controlled by meteorological conditions. The rate of concentration buildup depends on the intensity of atmospheric stability, with concentrations building up faster at urban sites than at rural sites (Turkiewicz et al., 2006). Figure 11 illustrates the differences in the PM2.5 buildup rate between an urban (Fresno) and a rural (Selma) site in the Fresno area during CRPAQS. Although urban sites reach the highest overall concentrations, at the end of an episode rural sites may reach equivalent levels. However, because of the lag in the overall buildup rate, rural sites have fewer days above the standard and lower episode-average concentrations.

Figure 11. Atmospheric stability and buildup of PM2.5 concentrations at an urban site (Fresno) and a rural site (Selma) in the Fresno area during the December 2000 CRPAQS episode.



The rate of buildup and the differences between urban and rural sites can be explained by the differential contributions of ammonium nitrate and organic carbon. Throughout the duration of an episode, ammonium nitrate concentrations tend to build to a plateau that is maintained until a weather front breaks the stagnation, causing the levels to decrease. Figure 12 illustrates the buildup of ammonium nitrate concentrations measured during the 2000/2001 PM2.5 episode in Bakersfield. This ammonium nitrate buildup generally begins in urban areas, followed by a buildup in rural areas as urban NOx is mixed downwind and reacts with rural ammonia. In contrast, organic carbon is largest in urban areas, and tends to be more stable across an episode, although individual peaks can occur during periods of enhanced wood burning such as weekends and holidays. The combination of early ammonium nitrate buildup along with the urban organic carbon increment results in the highest concentrations being observed in urban areas. The abrupt decrease in concentrations on January 8th was due to the passage of a cold front effectively ending the PM2.5 episode.

Figure 12. Ammonium nitrate concentrations at Bakersfield during the 2000/2001 CRPAQS episode.



5. SECONDARY AMMONIUM NITRATE FORMATION

a. Chemistry

As discussed previously, the cooler temperatures and higher humidity of the winter months are conducive to ammonium nitrate formation through a complex process involving NOx, ammonia, and VOCs. This occurs both at the surface and aloft, via both daytime and nighttime chemistry. Understanding the interactions amongst these precursors is needed to design an appropriate and effective approach to reduce ammonium nitrate.

During the day, NO_2 is oxidized to nitric acid (HNO_3). This daytime pathway also involves sunlight, VOCs, and background ozone:

$$NO \xrightarrow{O_3} NO_2 \xrightarrow{OH} HNO_3$$

Main oxidant is OH
Requires high sunlight, VOC rich environment

During the night, nitric acid is formed through oxidation of NO_2 (via N_2O_5) by background ozone:

$$NO \xrightarrow{O_3} NO_2 \xrightarrow{O_3} NO_3 \rightleftharpoons N_2O_5 \xrightarrow{H_2O} 2\,HNO_3$$

Main Oxidant is Ozone (O_3)
Favors low sunlight intensity, wet conditions

The nitric acid formed from these reactions then combines with ammonia (NH_3) to form ammonium nitrate (NH_4NO_3):

$$HNO_3 + NH_3 \longleftrightarrow NH_4NO_3$$

Since the chemistry of NOx to nitric acid formation involves multiple steps and also depends on the availability of oxidants, only a portion of the NOx emitted ultimately forms ammonium nitrate. An early photochemical modeling study applying a box model to a typical winter episode in the San Joaquin Valley found that approximately 33 percent of the molecules of emitted NOx were converted to ammonium nitrate (Stockwell et. al. 2000). A subsequent study that modeled the January 4-6, 1996 episode in the San Joaquin Valley with the University California Davis/California Institute of Technology (UCD-CIT) photochemical transport model found that on average, only 13 to 18 percent of the emitted NOx (expressed as NO_2) was converted to ammonium nitrate (Kleeman et. al. 2005). The fraction of NOx converted varied by location, with urban regions converting little NOx to ammonium nitrate, while in remote areas up to 70 percent NOx was converted.

As previously described, NOx emissions mostly originate from urban traffic and transportation corridors, while ammonia is primarily generated from livestock operations,

fertilizer application, and mobile sources. Analysis of CRPAQS measurements suggest that, on average, daytime production of nitric acid in the San Joaquin Valley is relatively slow, and that nighttime production is the more dominant pathway (Lurmann et al. 2006). Although daytime mixing is limited, NOx and ammonia emitted during the day can be mixed upward where nighttime interactions can occur more regionally to form ammonium nitrate. Based on analyses conducted to characterize the atmospheric transport and dispersion processes during the winter CRPAQS episodes, MacDonald et al. (2006) found that the ammonium nitrate that is formed aloft during the night is subsequently entrained into the daytime boundary layer. This was observed through a rapid rise in hourly ammonium nitrate concentrations which coincided with the growth of the surface mixed layer (Watson and Chow 2002). These mechanisms help explain the more regional distribution of ammonium nitrate that is observed throughout the Valley.

b. Limiting precursor concept

The amount of ammonium nitrate produced will depend on the relative atmospheric abundance of its precursors – VOCs, NOx, and ammonia (NH_3). It is therefore important to understand which precursor controls are most effective in reducing ammonium nitrate concentrations. In simple terms, the precursor in shortest supply will limit how much ammonium nitrate is produced. This is known as the "limiting" precursor. The following figures provide an illustration of this concept. As shown in Figure 13, each molecule of ammonia pairs with one NOx molecule to produce one molecule of ammonium nitrate. In this example, there are more ammonia molecules than NOx, and therefore not all of the ammonia participates in forming ammonium nitrate, i.e. there is "excess" ammonia. Figure 14 illustrates the impact of reducing NOx. Here, a reduction in NOx, the less abundant precursor, leads to a commensurate reduction in ammonium nitrate. In contrast, Figure 15 illustrates that a larger reduction in the more abundant precursor, ammonia, results in no reduction in ammonium nitrate, as the ammonia reduced did not participate in ammonium nitrate production.

Figure 13. Ammonium nitrate formation.

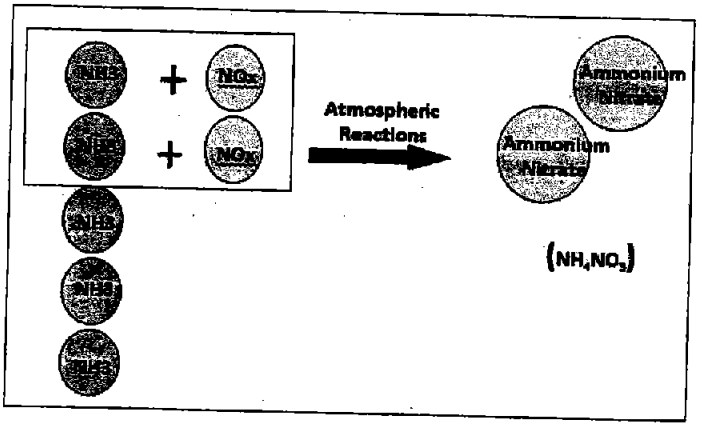


Figure 14. Reducing the less abundant precursor is more effective in reducing ammonium nitrate.

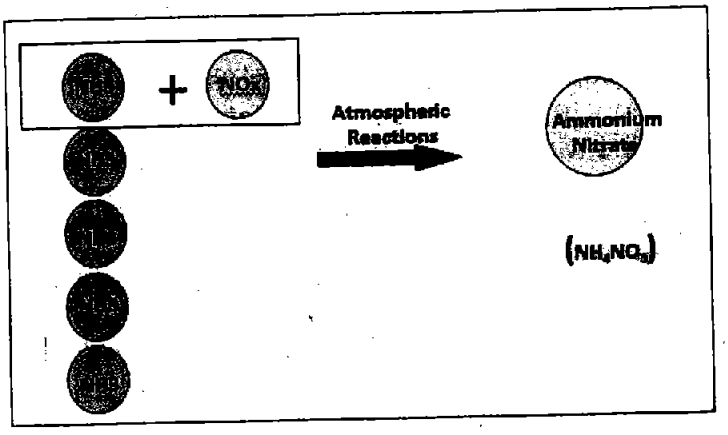
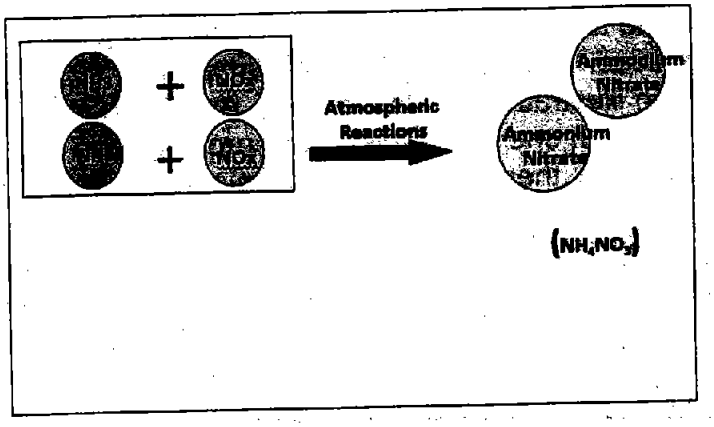


Figure 15. Reducing the more abundant precursor is less effective in reducing ammonium nitrate.



The following sections describe the current state of the science regarding the role of ammonia, VOCs, and NOx in ammonium nitrate formation and identify the most effective precursors for control.

c. Role of ammonia in ammonium nitrate formation

A number of different studies and analyses were evaluated to understand the role of ammonia in ammonium nitrate formation in the San Joaquin Valley. These included: a) comparison of the magnitude of the NOx and ammonia emissions inventories, b) ambient measurements of ammonia, nitric acid, and particulate ammonium; and c) photochemical modeling analyses of ammonium nitrate sensitivity to precursor emission reductions. While evaluation of emissions inventory and ambient data can provide indications of the relative abundance of different precursors, photochemical models provide a tool to quantitatively evaluate the impact of reducing precursor emissions on resulting ammonium nitrate concentrations.

Emission inventory

As discussed in the limiting precursor section, the precursor in shortest supply limits the amount of ammonium nitrate formation. An evaluation of the magnitude of NOx and ammonia emissions provides a first level assessment of the relative abundance of these two precursors. Table 1 lists NOx and ammonia winter emissions in the current inventory for three years (2000, 2011, and 2019). As Figure 13 in the limiting precursor section illustrated, in simple terms it takes one molecule of NOx and one molecule of ammonia to form one molecule of ammonium nitrate. However, due to differing molecular weights, one ton of NOx contains fewer molecules than one ton of ammonia. Therefore it is most appropriate to make an emissions inventory comparison after normalizing for molecular weight.

Due to emission source test procedures, most NOx emissions are expressed in terms of nitrogen dioxide (NO_2). Since one NO_2 molecule weighs 46 universal atomic units (u) and one NH_3 molecule weighs 17 u, one ton of NH_3 has 2.7 times (46 u/17 u) the number of molecules as one ton of NO_2. Dividing the NOx emissions by 2.7 therefore provides a common basis for comparison to the ammonia emissions. On this normalized comparison basis, ammonia is significantly more abundant than NOx, particularly in future years (Table 1). In addition, as noted in the chemistry section, only a portion on the NOx is ultimately converted to ammonium nitrate.

Table 1. Comparison of NOx and ammonia emissions in selected years.

Year	Winter NH_3 emissions (tpd)	Winter NOx emissions (tpd)	Normalized NOx emissions (tpd)
2000	330	550	204
2011	386	330	122
2019	360	209	77

Monitoring studies

Ambient measurements of precursor concentrations provide another method to investigate the relative abundance of each precursor and therefore which is most effective for control of ammonium nitrate. Blanchard, et al. (2000) examined two metrics using ambient data collected during the IMS-95 field program in the San Joaquin Valley. The first parameter was the excess of particulate ammonium plus gas-phase ammonia over the sum of nitric acid, particulate nitrate, and particulate sulfate. The second was the ratio of particulate to total nitrate concentrations. Both metrics indicated an excess of ammonia in most IMS-95 samples and concluded that greater reductions in aerosol nitrate would occur when nitric acid was reduced rather than ammonia.

Lurmann, et al. (2006) also compared ammonia and nitric acid ambient concentrations measured in the San Joaquin Valley during the winter of 2000/2001 as part of CRPAQS. Figures 16 and 17 show the concentrations of nitric acid and ammonia measured at the rural Angiola site and at the urban Fresno site. At both sites ammonia concentrations are generally at least an order of magnitude higher than the nitric acid concentrations. These ammonia-rich conditions throughout the Valley indicate that, during the winter, nitric acid rather than ammonia is the limiting precursor.

Figure 16. Comparison of ammonia and nitric acid concentrations measured at Angiola during the winter of 2000/2001 as part of CRPAQS.

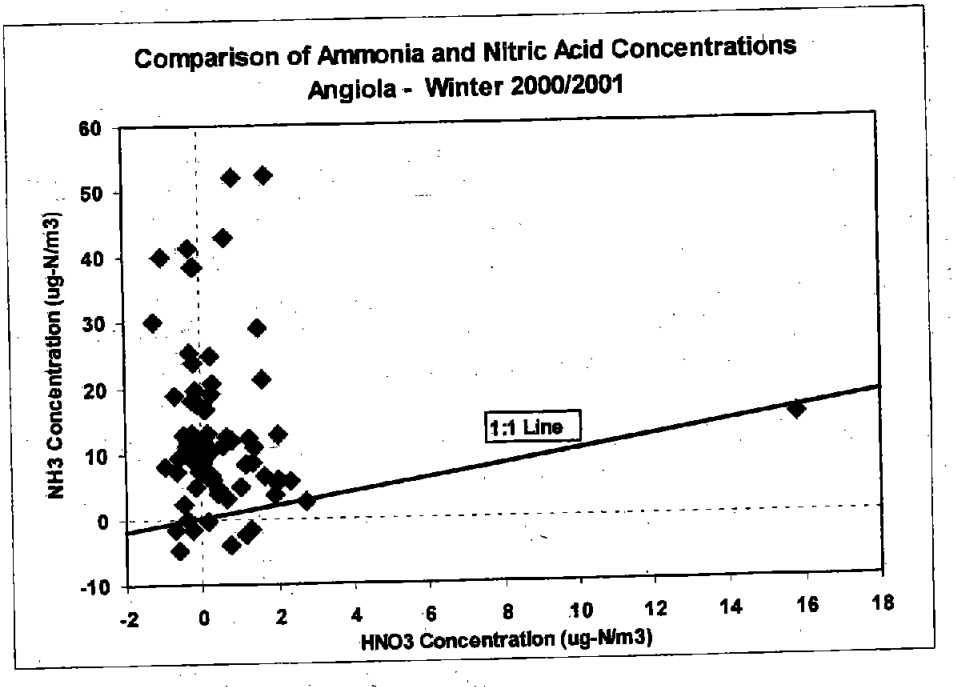
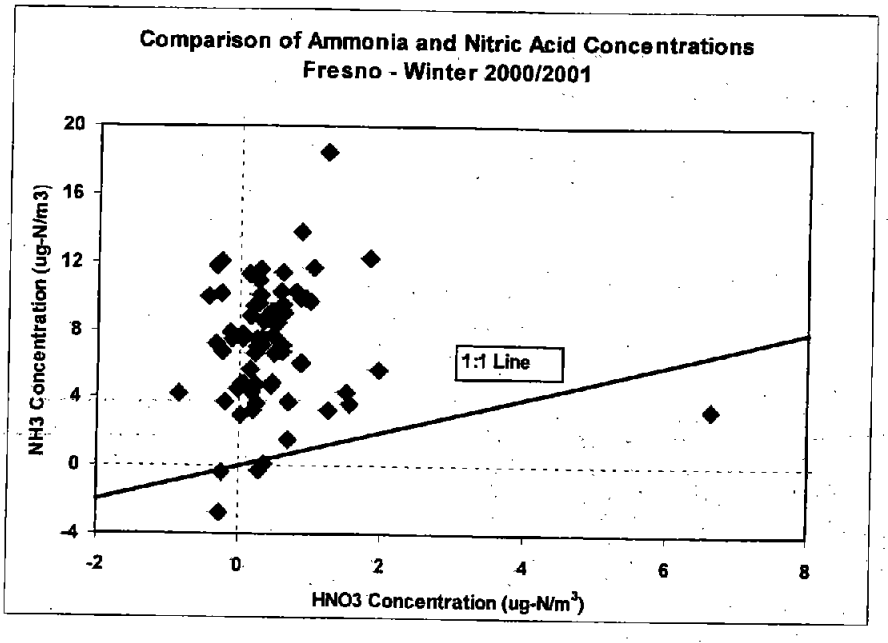
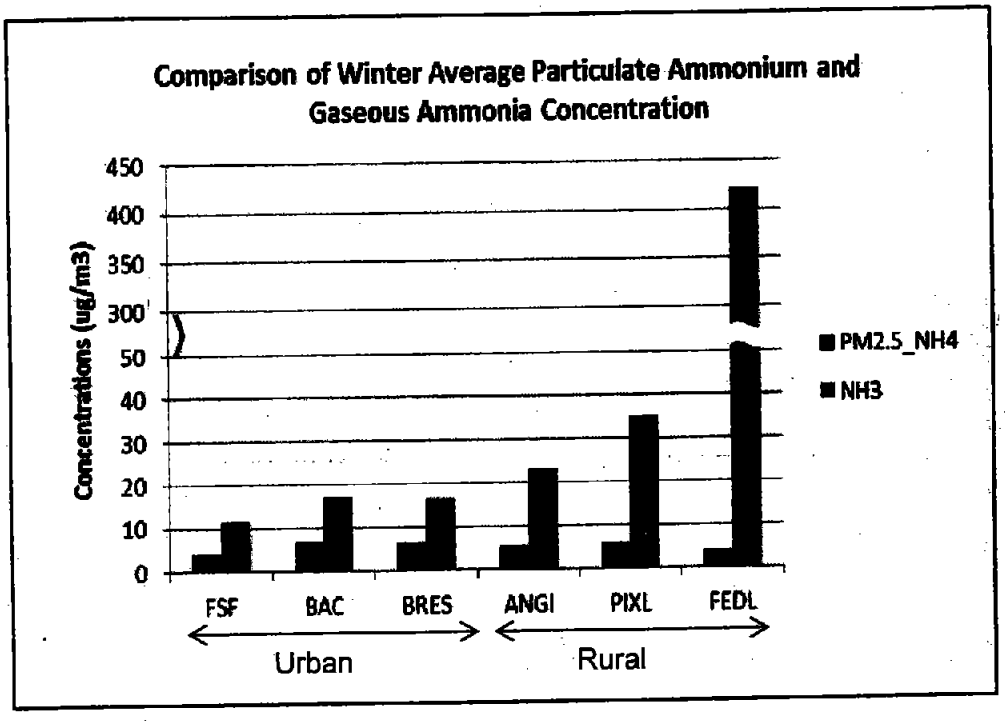


Figure 17. Comparison of ammonia and nitric acid concentrations measured at Fresno during the winter of 2000/2001 as part of CRPAQS.



The amount of gaseous ammonia (NH3) compared to particulate ammonium (NH4) provides another indicator of how much of the ammonia is converted to ammonium nitrate and therefore whether there is excess ammonia available. These measurements were collected at a larger number of sites during CRPAQS. Figure 18 shows the concentrations of particulate ammonium and gaseous ammonia at three urban sites (Fresno-1st, Bakersfield-California, and Bakersfield-residential), and three rural sites (Angiola, Pixley, and Feedlot) measured during the 2000/2001 winter CRPAQS episode. Overall, the levels of particulate ammonium at all sites are comparable, consistent with a regional formation mechanism of ammonium nitrate. Although ammonia concentrations are higher at the rural sites, especially at the Feedlot site, there is still a large amount of ammonia at each site beyond the amount that reacted with nitric acid to form ammonium nitrate. Again, these ammonia rich conditions indicate that nitric acid, rather than ammonia is the limiting precursor.

Figure 18. Comparison of particulate ammonium and gaseous ammonia concentrations measured throughout the SJV during the winter of 2000/2001 as part of CRPAQS.

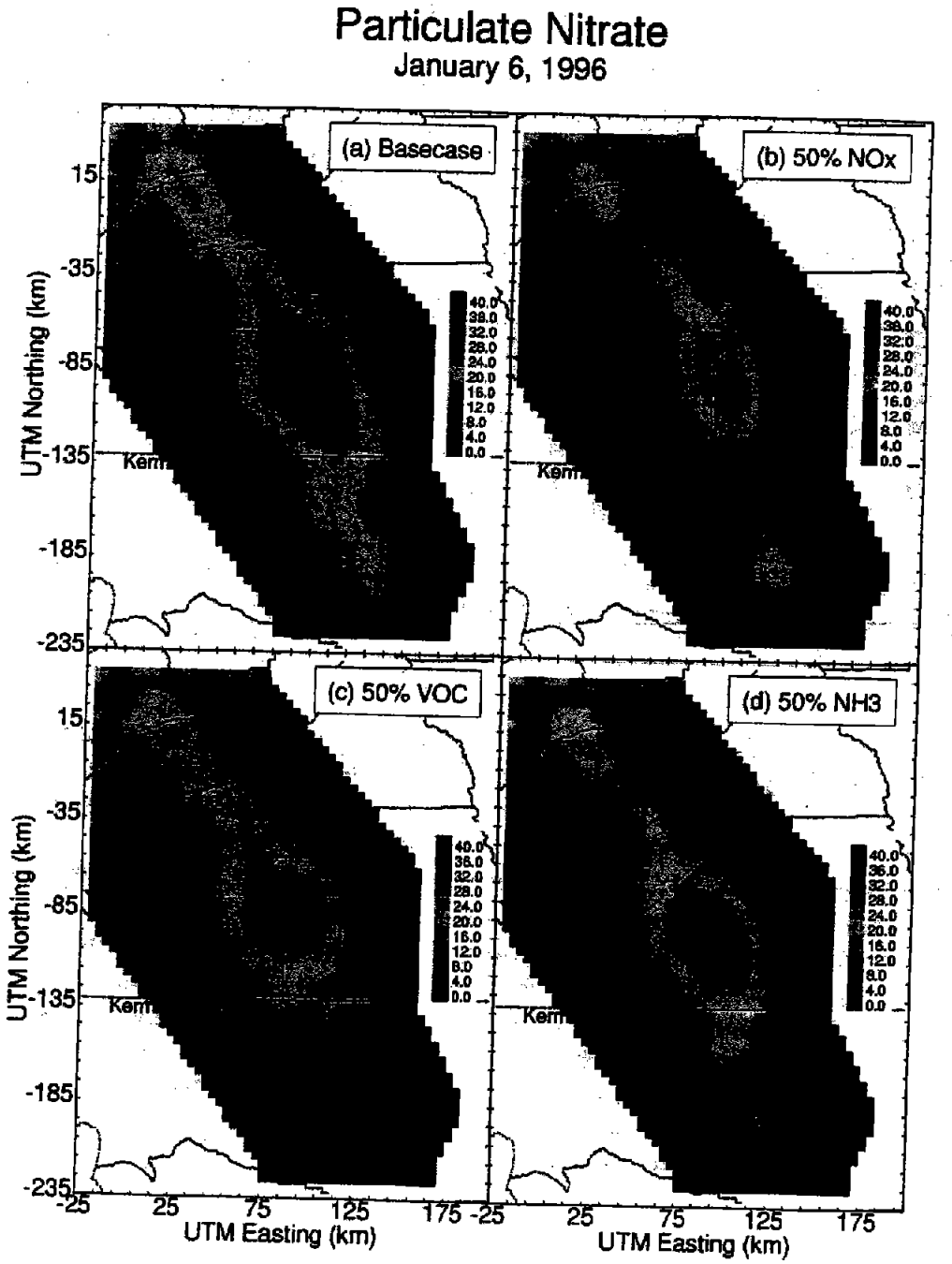


Photochemical Modeling

In contrast to the previous analyses, photochemical models provide a quantitative approach to simulate the effects that emission reductions in each of the gaseous precursors would have on the predicted ammonium nitrate concentrations. A number of modeling studies have been conducted by ARB staff and academic researchers to evaluate precursor sensitivity.

An investigation of precursor limitations for the January 4-6, 1996 PM2.5 episode measured in San Joaquin Valley as part of the IMS-95 field study used the UCD-CIT model. This sensitivity analysis revealed that NOx controls were the most effective control strategy to reduce PM2.5 ammonium nitrate concentrations (Kleeman, et al. 2005). In this study, a 50 percent reduction in NOx emissions resulted in a 25 percent reduction in total nitrate, while a 50 percent reduction in ammonia emissions resulted in a 10 percent reduction in total nitrate. The results of this analysis are shown graphically across the entire San Joaquin Valley in Figure 19.

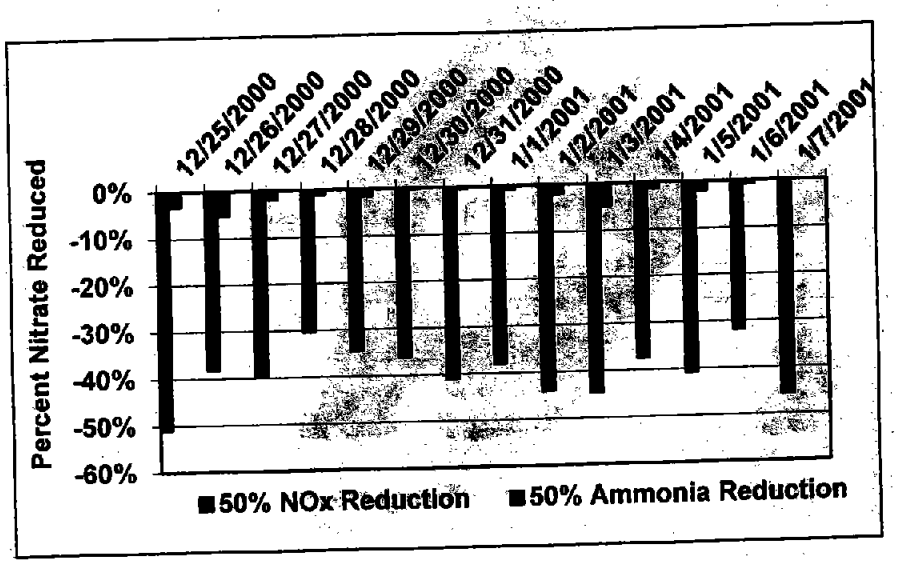
Figure 19. Particulate nitrate reductions in response to 50 percent reductions in precursor emissions on January 6, 1996.



In 2006, ARB staff modeled air quality during the three week winter CRPAQS episode using U.S. EPA's Community Multiscale Air Quality (CMAQ) model with California-specific modifications and corrections (Liang et al. 2006). Figure 20 illustrates the effects that reducing the emissions of ammonia and NOx have on ammonium nitrate levels. This modeling indicated that reducing ammonia emissions by 50 percent

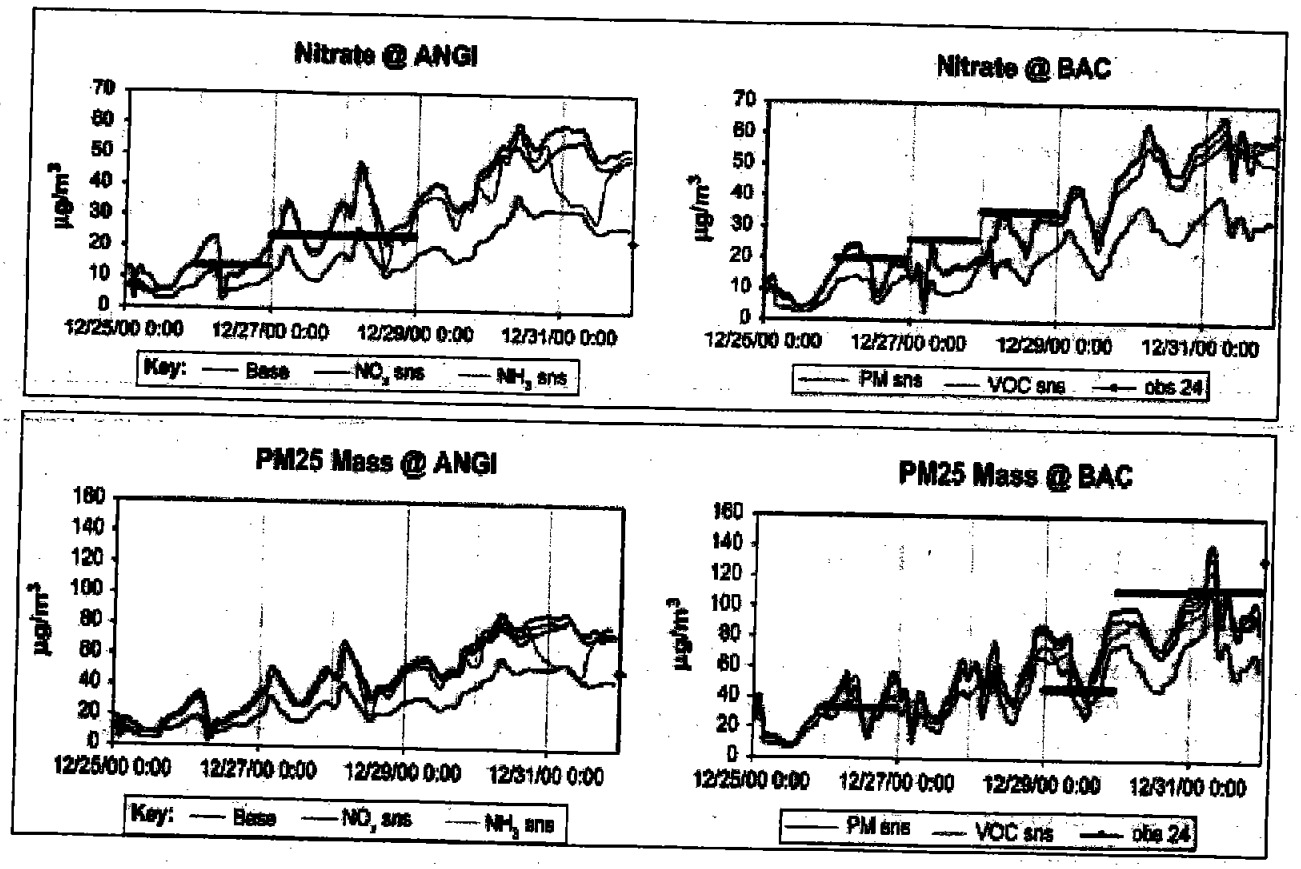
reduced ammonium nitrate by less than 5 percent. On the other hand, reducing NOx emission by 50 percent reduced ammonium nitrate concentrations by approximately 35 percent. This analysis, therefore, indicated that reducing NOx emissions was the most beneficial control strategy to reduce ammonium nitrate.

Figure 20. Percent ammonium nitrate reduction in response to 50 percent reduction in NOx or ammonia emission reductions at Fresno during the winter of 2000/2001.



In another study based on sensitivity analyses using CMAQ-Madrid simulations of the December 2000 CRPAQS episode, Pun et al. (2009) found that a 50 percent reduction in NOx emissions reduced ammonium nitrate by approximately 50 percent at rural sites and between 30-45 percent at Bakersfield. As shown in Figure 19, a 50 percent reduction in ammonia emissions did not have a significant effect on ammonium nitrate concentrations at urban sites. At the rural site of Angiola, ammonium nitrate concentrations decreased between 10 and 25 percent. However, such reductions in ammonium nitrate occurred only at the end of the episode, when PM2.5 concentrations at the rural site reached approximately 80 $\mu g/m^3$ and urban concentrations peaked at over 110 $\mu g/m^3$ (Figure 21). Such high PM2.5 levels are no longer reached in the Valley. The authors noted that under wintertime conditions, nitric acid concentrations in the SJV were small and therefore ammonium nitrate formation was generally limited by the availability of nitric acid rather than ammonia.

Figure 21. Time series with daily observations, base case simulation results and results from the sensitivity cases of (a) nitrate and (b) PM2.5 at Angiola (left) and Bakersfield (right). (Source: Pun et al., 2009, excerpt from Figure 2, pg. 406).



Taken together, the emission inventory, monitoring data, and precursor sensitivity analyses all indicate that in the San Joaquin Valley, NOx, rather than ammonia is the limiting precursor for ammonium nitrate formation.

d. Role of VOC in ammonium nitrate formation

A number of studies have also been examined regarding the role of VOCs in ammonium nitrate formation. These include both monitoring studies conducted as part of CRPAQS, as well as studies that used differing types of air quality modeling to quantitatively assess the expected change in ammonium nitrate to hypothetical VOC reductions.

Monitoring studies

As previously mentioned, there are two primary pathways through which ammonium nitrate can form. During the day, NO_2 is oxidized to nitric acid. Nitric acid then reacts with ammonia to form ammonium nitrate. This daytime nitric acid formation pathway involves sunlight, VOCs, and background ozone. During the night, nitric acid is formed

through oxidation of NO_2 (via N_2O_5) by background ozone, which then also reacts with ammonia to form ammonium nitrate. Studies by Pun et al. (1998, 2004) suggested that the daytime pathway may be important and therefore the formation of ammonium nitrate would be sensitive to changes in VOC emissions. However, other studies (Lurmann et al., 2006), suggest that on average, daytime production of nitric acid in the San Joaquin Valley is relatively slow and that nighttime production of ammonium nitrate aloft, which then mixes to the surface after sunrise could explain the observed homogeneous patterns of ammonium nitrate in the Valley. Ying et al. (2009) also theorized that the ozone concentration aloft in the San Joaquin Valley is predominantly due to the regional background and does not vary significantly with surface-level VOC emissions. Therefore, nighttime ammonium nitrate formation in the San Joaquin Valley would not be sensitive to VOC reductions.

While the monitoring studies cited above provide evidence that the VOC pathway may be important at times, these studies do not provide quantitative information about the overall role of and cannot be used to evaluate the benefits of, VOC controls. Rather, modeling studies are more appropriate to assess the overall impact of precursor controls.

Photochemical Modeling

Staff reviewed the results of six modeling studies containing information on the significance of VOC controls in reducing ammonium nitrate in the San Joaquin Valley. While the results of the earliest studies were mixed, later studies provide generally consistent results regarding the role of VOCs. In assessing the potential benefits of VOC controls it is important that significance be interpreted in the context of California's overall control program with its strong focus on NOx control to achieve benefits for both PM2.5 and ozone.

Two early studies used simplified box modeling to explore the sensitivity of ammonium nitrate to VOC and NOx reductions. One of the two studies simulated a typical winter episode (Stockwell et al., 2000) and found that decreases in VOC emissions had little effect. The second study (Pun and Seigneur, 2001) simulated winter conditions during the 1996 IMS-95 pilot study around the Fresno area. The study found that ammonium nitrate formation decreased with VOC emission reductions, but increased with NOx reductions. Pun and Seigneur (2001) theorized that reducing NOx could lead to higher concentrations of the hydroxyl radical (OH) and increase the overall rate of nitrate production, despite the reductions in NOx. However, the box modeling approach used had a number of limitations, including lack of transport into/out of the box, robust vertical transport, and use of an older chemical mechanism. In addition, the VOC emissions were increased by a factor of two to improve model performance. As such, the box modeling did not fully represent the complete scope of atmospheric variations and has limited usefulness in assessing the responsiveness to VOC controls.

Subsequent modeling sensitivity studies for the same winter episode were conducted with the UCD-CIT model, an advanced research grade modeling system (Kleeman et al., 2005). The authors concluded that NOx emission controls are more effective in reducing PM2.5 nitrate concentrations in the San Joaquin Valley. Summary study results indicate that on average, large reductions in VOC emissions (on the order of 50 percent) reduced PM2.5 nitrate concentrations by approximately 17 percent. However, to evaluate the significance and effectiveness of VOC controls in the context of control strategy design, the study's isopleths of PM2.5 nitrate response to combined NOx/VOC emission reductions provide more in-depth information.

Figures 22 (a) and 23 (a) show that, based on the shapes of the graphs, NOx controls are the most effective approach to reduce PM2.5 nitrate concentrations at Fresno and at the location with the highest modeled PM2.5 nitrate concentration (grid location - 85 km Northing, 90 km Easting) respectively. Once NOx controls are taken into consideration, VOC emission reductions produce essentially no benefit, and in some instances may actually lead to an increase in PM2.5 nitrate concentrations. For example, as illustrated in Figure 22 (a) for Fresno, after considering an approximately 70 percent reduction in NOx emissions resulting from existing and proposed controls, reductions in VOC emissions to any level would not decrease PM2.5 nitrate concentrations. Furthermore, at grid location -85 km Northing, 90 km Easting (Figure 23 (a)), any level of VOC emission reductions would actually cause an increase in nitrate concentrations. Nitrogen-containing molecules such as PAN can act as temporary sinks for nitrogen dioxide (NO_2). When VOCs are controlled, the reduced availability of certain radicals, which are generated from VOCs, reduces the amount of NO_2 that is sequestered, thereby increasing the availability of NO_2 and enhancing ammonium nitrate formation (Meng et al., 1997).

Figure 22. 24-hour average NOx/VOC particulate nitrate isopleths at Fresno for (a) all sources, (b) diesel engines, (c) catalyst equipped gasoline engines, and (d) upwind sources of nitrate. Units are μg/m^3. (Source: Kleeman et al., 2005, Figure 3 pg. 5333).

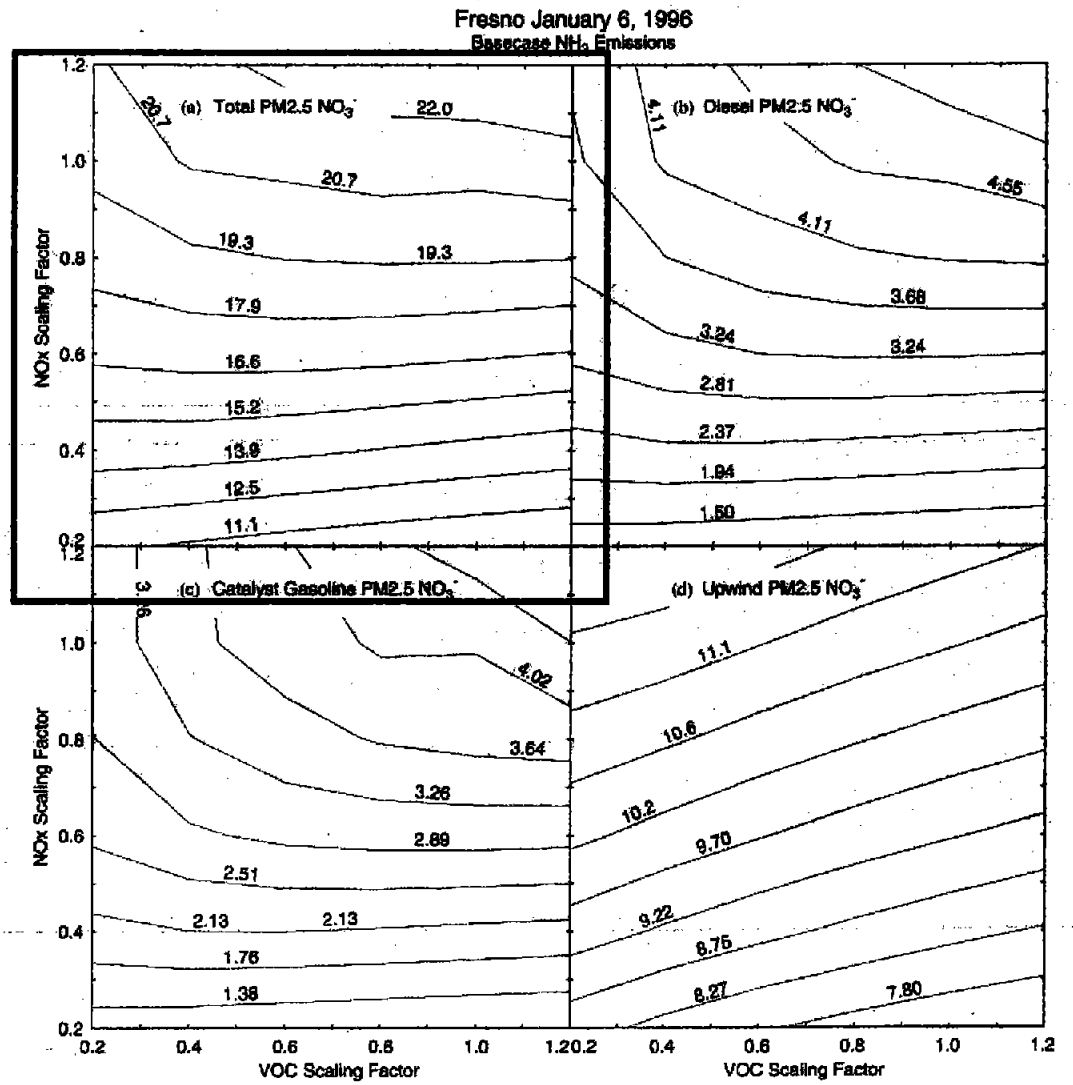
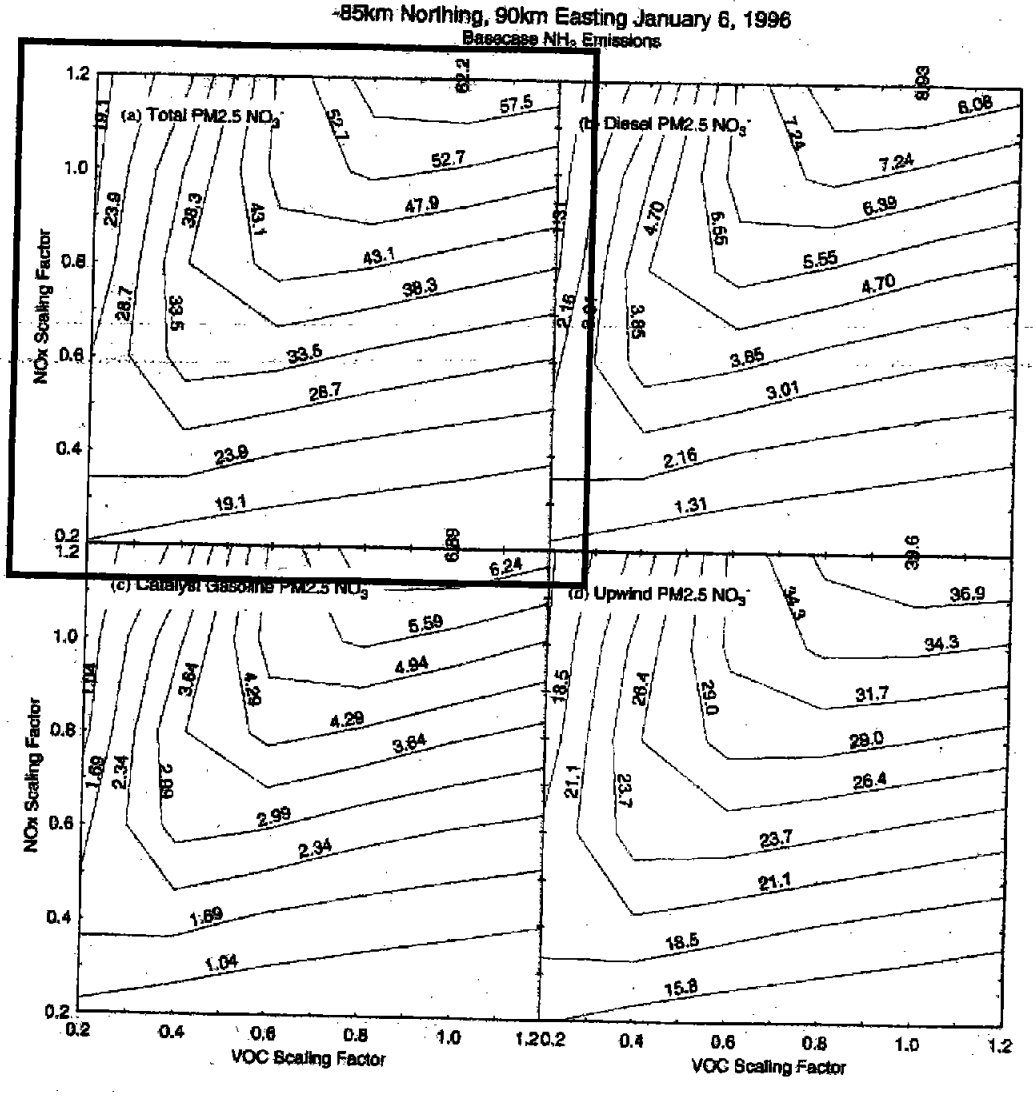


Figure 23. 24-hour average NOx/VOC particulate nitrate isopleths at grid location -85 km Northing, 90 km Easting for (a) all sources, (b) diesel engines, (c) catalyst equipped gasoline engines, and (d) upwind sources of nitrate. Units are $\mu g/m^3$. (Source: Kleeman et al., 2005, Figure 5 pg. 5335).

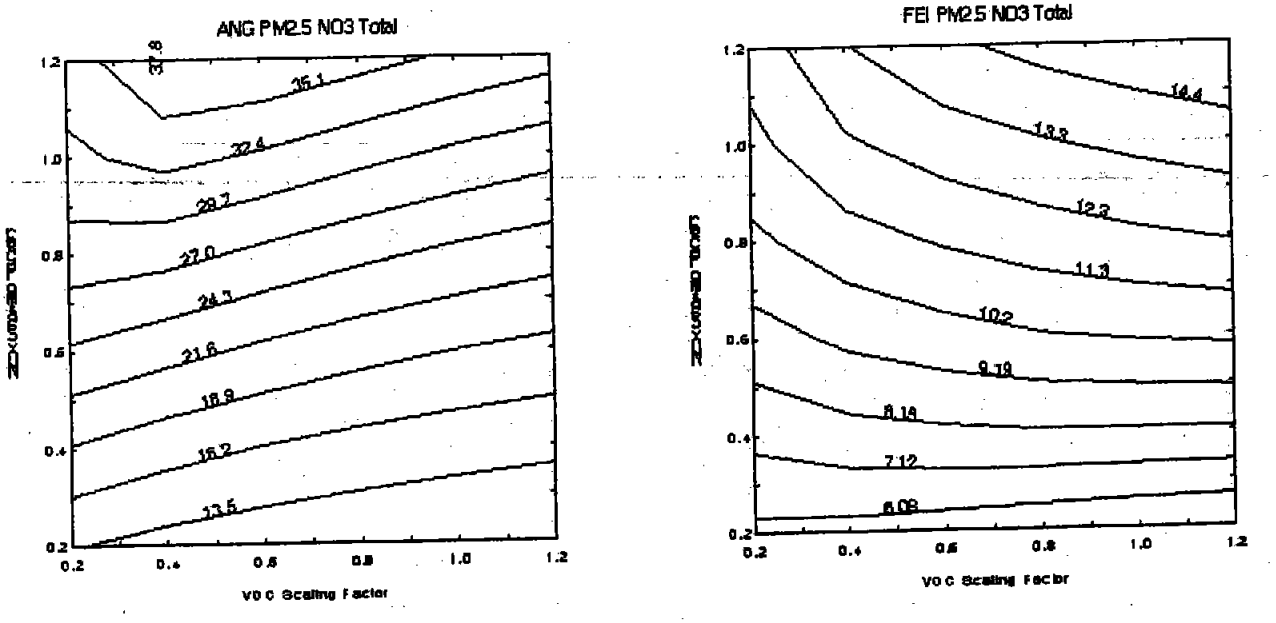


Three additional modeling studies investigated the more recent two-week winter episode of 2000-2001 that occurred during the CRPAQS field study.

In the first study, preliminary data from modeling of this CRPAQS winter episode conducted using the Lagrangian form of the UCD-CIT model qualitatively confirm that NOx control is the most efficient method to reduce nitrate concentrations (Kleeman, M.J., personal communication, May 2008). Figure 24 illustrates the response of PM2.5 nitrate concentrations to NOx and VOC emission reductions at a rural (Angiola) and an urban (Fresno) site on December 31, 2000. Again, based on their shapes, these graphs show that NOx controls are the most effective approach to reduce PM2.5 nitrate

concentrations. Once NOx controls are taken into consideration (approximately 70 percent reduction in NOx emissions), reductions in VOCs of up to 30 percent produce basically no benefit (Fresno). Furthermore, at some locations (Angiola) any VOC emission reductions may actually lead to an increase in PM2.5 nitrate concentrations.

Figure 24. The isopleths plot of PM2.5 nitrate with emission control of NOx and VOC at Angiola (ANG) and Fresno (FEI) after a five-day back trajectory simulation for December 31, 2000. Units are in $\mu g/m^3$. (Source: Kleeman, M.J., personal communication, May 2008).



A second study conducted simulations of the two-week CRPAQS episode with the CMAQ photochemical model (Livingston, et al., 2009). The study consisted of two simulations. The first was a baseline scenario using a preliminary emissions inventory. This simulation showed that 50 percent reductions in anthropogenic VOC and NOx emissions had similar effects in reducing ammonium nitrate (about 20 percent each). A second simulation was conducted using an updated emission inventory representing a more accurate spatial distribution of total ammonia emissions (referred to as "Vehicle NH_3" scenario, per Livingston, P., personal communication, January 19, 2011). This second 50 percent VOC reduction simulation showed a much lower response to VOC controls. The response was lowered to a 12 percent reduction in ammonium nitrate, with a corresponding increase in responsiveness to NOx control of 38 percent reduction in ammonium nitrate. These results are consistent with those found by Kleeman et al., 2005.

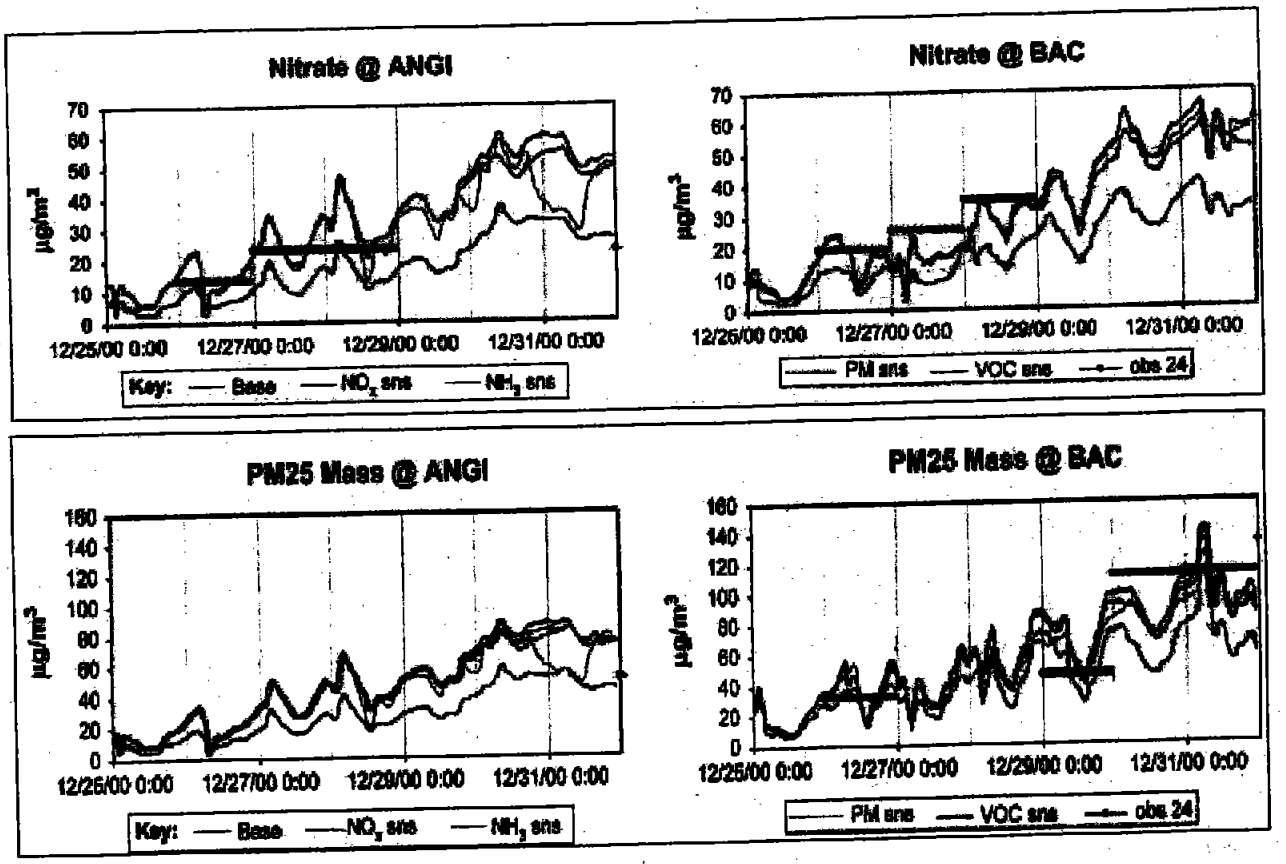
A third study modeled one week of the CRPAQS episode using a version of CMAQ with a more advanced chemical mechanism (CMAQ-Madrid) (Pun et al, 2009). In contrast to the earlier Pun study using a simplified box modeling approach, this later work found

that on average, nitrate was most sensitive to reductions in NOx emissions. While isopleths were not provided, the time evolution of nitrate and PM2.5 mass to VOC response illustrated in Figure 25 provides further details regarding the efficacy of VOC control. The response of nitrate to a 50 percent reduction in VOC emissions increased as PM2.5 levels rose during the episode. In urban areas, a 50 percent reduction in anthropogenic VOC emissions caused small reductions in nitrate, on the order of 10 percent, on the modeled days when 24-hour PM2.5 concentrations measured over 100 $\mu g/m^3$ at urban sites and above 65 $\mu g/m^3$ in rural areas.

The difference in the VOC response on the days with the higher PM2.5 concentrations as compared to those days with lower concentrations may be due to a difference in the chemical formation regime for nitrate. In general, there is sufficient background ozone to generate enough free radicals to initiate and propagate the chemistry of nitrate formation (Ying et. al, 2009). However, on days with high PM2.5 concentrations, the daytime photochemistry may have contributed to a rapid increase in nitrate, resulting in higher VOC and NOx sensitivity. It does not appear that VOCs contributed significantly to the free radical budget on the simulated days mainly because rapid increases in ozone were not observed. The effect of VOC levels on nitrate formation may also have a diurnal pattern since the hydroxyl and hydroperoxyl radical levels are high during the daytime and negligible at night. In addition, more reactive VOCs react quickly during the day and there is a minimal carry over to the next day. Therefore, it is reasonable to assume that the higher response to VOC and NOx at higher PM2.5 concentrations may be due to the nitrate formation mechanism rather than to PM2.5 accumulation due to the length of the episode.

Overall, nitrate was only responsive to a 50 percent reduction in VOCs at PM2.5 concentration levels that are no longer reached in the San Joaquin Valley. Currently, the 24-hour PM2.5 design value in the Valley is 62 $\mu g/m^3$ recorded at Bakersfield and the rest of the Valley records 24-hour design values between 38 $\mu g/m^3$ and 58 $\mu g/m^3$. Given the current levels of PM2.5, we believe the Valley is now in a nitrate chemical formation regime that is less responsive to VOC controls.

Figure 25. Time series with daily observations, base case simulation results and results from the sensitivity cases of (a) nitrate and (b) PM2.5 at Angiola (left) and Bakersfield (right). (Source: Pun et al., 2009, excerpt from Figure 2, pg. 406).



Taken together, these air quality modeling studies indicate that in the San Joaquin Valley, NOx, rather than VOCs, is the limiting precursor for nitric acid, and subsequent ammonium nitrate formation.

6. SECONDARY ORGANIC AEROSOL FORMATION

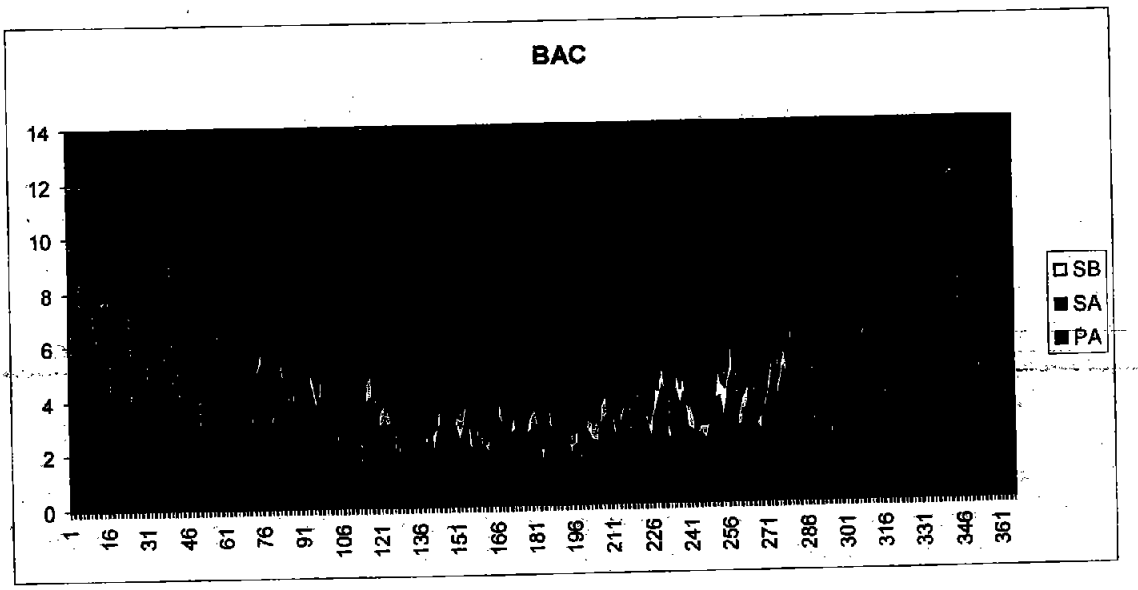
VOC emissions also have the potential to contribute to secondary organic aerosols (SOA). While these components contribute to observed PM2.5 concentrations in the San Joaquin Valley to a small degree, the weight of evidence indicates that anthropogenic VOC is not a significant contributor to PM2.5.

SOA form when intermediate molecular weight VOCs, emitted by anthropogenic and biogenic sources, react and condense in the atmosphere to become aerosols. In addition, lighter VOCs participate in the formation of atmospheric oxidants which then participate in the formation of SOA. The processes of SOA formation are complex and have not been fully characterized. The apportionment of PM2.5 organic carbon to primary and secondary components is a very active area of current research.

Using the UCD-CIT model, Chen et al. (2010) investigated the apportionment of PM2.5 organic carbon for the 2000/2001 CRPAQS episode. From the total predicted PM2.5 organic carbon in the urban Fresno and Bakersfield areas, six percent and four percent were SOA, respectively, while in the rural Angiola area, 37 percent was SOA. The major SOA precursors of secondary organic aerosol were long-chain alkanes followed by aromatic compounds. The sources of these precursors were solvent use, catalyst gasoline engines, wood smoke, non-catalyst gasoline engines, and other anthropogenic sources, in that order.

In contrast, on an annual average basis, secondary organic aerosols derived from anthropogenic VOC emissions account for only one to two percent of the annual total PM2.5 concentrations throughout the Valley. ARB air quality modeling exercises conducted as part of the SJV 2008 PM2.5 Plan attainment demonstration analysis using the CMAQ model showed that primary PM2.5 emissions are the main contributor to organic aerosols and SOA contribute to only a small extent. Furthermore, as illustrated in Figure 26, SOA are mostly formed during the summertime, when total PM2.5 concentrations are low, and are mainly derived from biogenic emission sources. On an annual average basis, SOA derived from anthropogenic VOC emissions are a small part of the organic aerosol concentrations (three to five percent).

Figure 26. Daily contributions to organic aerosol concentrations in Bakersfield in 2000 modeled with CMAQ: Primary organic aerosols (PA), secondary aerosols formed from biogenic VOC emissions (SB) and secondary aerosols formed from anthropogenic source VOC emissions (SA). Units are $\mu g/m^3$.



As part of the CRPAQS study, simulations of a wintertime episode conducted using CMAQ-Madrid, a model with an enhanced secondary organic aerosol formation mechanism, also found that organic aerosol concentrations were dominated by directly emitted (primary) emissions. The study found that, because of the dominance of primary PM2.5 organic matter, a 50 percent reduction in anthropogenic VOC emissions has limited effects on the modeled PM2.5 organic matter (Pun, et al., 2009).

These study results show that for secondary organic aerosols, further VOC reductions would have very limited effectiveness in reducing PM2.5 concentrations.

7. EMISSION SOURCES OF WINTERTIME PM2.5

a. Emission inventory

Emission inventories provide emission estimates for sources of directly emitted (primary) PM2.5 and of each of the gaseous precursors of secondary PM2.5 (NOx, SOx, and ammonia). Table 2 lists the main PM2.5 components and links them to their largest emission sources based on the 2011 San Joaquin Valley emission inventory data. Emission sources are listed in descending order of magnitude.

As described in section 4d, ammonium nitrate is the main PM2.5 component, contributing about 55 to 65 percent of PM2.5. It is formed in the atmosphere from reactions of NOx and ammonia. Heavy-duty diesel vehicles (trucks) emit most of the NOx, followed by off-road equipment, light-duty vehicles, and trains. Ammonia is primarily emitted from livestock husbandry, fertilizer application, and mobile sources. Ammonium sulfate, formed in the air from reactions of SOx and ammonia, contributes about five percent to PM2.5. SOx is mostly emitted from fuel combustion sources in oil and industrial manufacturing processes. Organic carbon, which contributes about 20 to 30 percent to PM2.5, and elemental carbon, which contributes about five percent of PM2.5, are directly emitted, with key sources being residential fuel combustion, managed burning, diesel trucks, and commercial cooking operations. Geological, a minor component contributing about two to five percent of the PM2.5 mass, is directly emitted from activities generating dust, such as farming operations and on-road and off-road vehicle travel, as well as wind-blown dust. It should be noted that while wind-blown dust may contribute on some winter days, PM2.5 exceedances primarily occur on very stagnant days when windblown dust emissions are minimal.

While emission inventories provide a broad overview of Valley wide and county level sources, additional methods using ambient data and source apportionment modeling provide supplemental information on the sources directly impacting individual monitoring sites. The following sections describe these analyses.

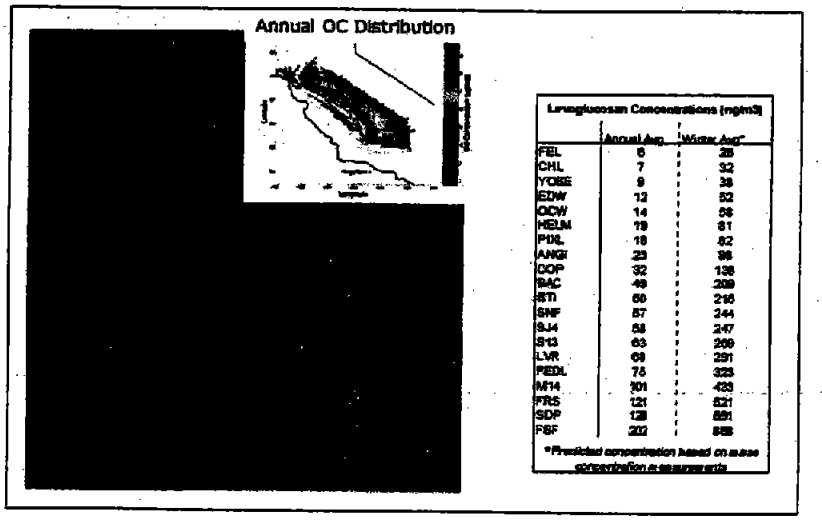
Table 2. Main emission sources of PM2.5 components.

PM2.5 Component (percent of PM2.5)	**Process**	**Emission Sources**
Ammonium nitrate (about 55-65 percent)	Formed in the atmosphere from the reactions of NOx and ammonia emissions	**NOx:** Heavy duty diesel vehicles account for 40 percent of the 2011 winter NOx emissions. Farm equipment, off-road equipment, light and medium duty trucks, trains, light duty passenger cars, and residential fuel combustion account for an additional 40 percent.
		Ammonia: Livestock husbandry, fertilizer application, and mobile sources account for over 90 percent of the 2011 winter ammonia emissions.
Ammonium sulfate (about 5 percent)	Formed in the atmosphere from the reactions of SOx and ammonia emissions	**SOx:** Fuel combustion in oil production, at electric utilities, and in manufacturing and industrial boilers, heaters, and engines, manufacturing of chemicals and glass related products, residential wood combustion, and aircraft account for about 75 percent of the 2011 winter SOx emissions.
Organic Carbon (about 20-30 percent)	Directly emitted from motor vehicles and combustion processes	**Combustion PM2.5**: Residential fuel combustion, managed burning and disposal, diesel trucks, cooking, oil and gas production, and farm equipment account for 80 percent of the combustion PM2.5 emissions.
Elemental Carbon (about 5 percent)	Directly emitted from motor vehicles and combustion processes	
Geological (about 2-5 percent)	Directly emitted from dust generating sources	**Dust PM2.5:** Farming operations, fugitive windblown dust, paved and unpaved road dust, mineral processes, and construction and demolition account for 100 percent of the 2011 dust PM2.5 emissions.

b. Chemical markers of source types

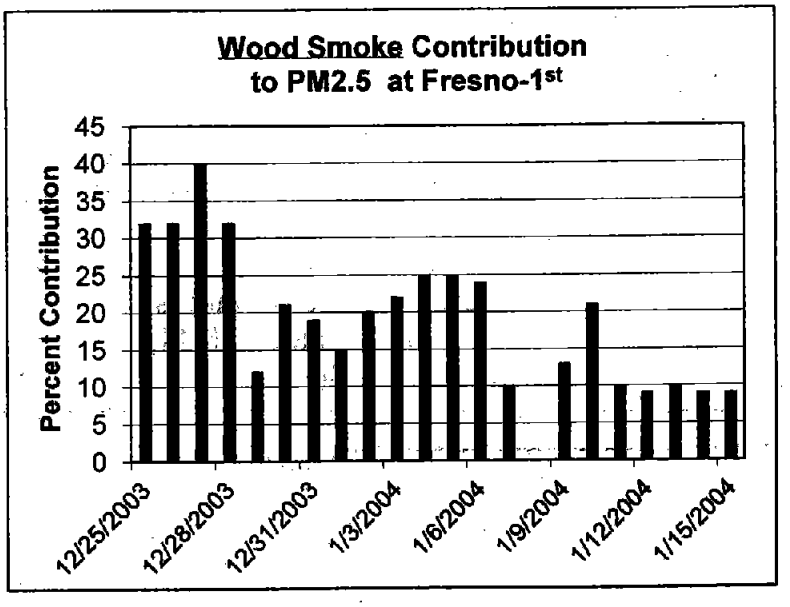
Selected compounds measured in the atmosphere can serve as chemical markers for specific sources. Based on this approach, as part of the extensive monitoring effort during CRPAQS, residential wood combustion was identified as the main source of PM2.5 organic carbon in the San Joaquin Valley. Measurements of levoglucosan, a chemical marker for wood smoke were conducted throughout the San Joaquin Valley. Figure 27 illustrates the geographical distribution of the annual averages of these levoglucosan measurements (pink circles on the map). Each circle size is proportional to the levoglucosan concentration. The largest levoglucosan levels occurred in urban areas, most notably the Fresno area (FSF and FSR), as did the largest PM2.5 organic carbon levels depicted on the small map to the upper left. The second largest levoglucosan levels the San Joaquin Valley were measured in Modesto (M14), sequentially followed by Bakersfield (BAC) and then Corcoran (COP).

Figure 27. Spatial distribution of annual levoglucosan measured throughout the San Joaquin Valley during CRPAQS (Watson, J., Roth, P., 2006).



Additional measurements of levoglucosan collected during the winter of 2003/2004 in the Fresno area showed wood smoke was a significant percentage of PM2.5 at all locations, ranging from 10 to 40 percent (Figure 28).

Figure 28. Wood smoke contribution to PM2.5 at Fresno-1st during a number of winter days in 2003 and 2004 (Gorin et al., 2005).



c. Source apportionment using source receptor models

Source receptor models (also known as observational models) can be used to determine the relative importance of the different types of PM2.5 emission sources at individual monitoring sites. The Chemical Mass Balance (CMB) model statistically relates measured chemical species of ambient PM2.5 to the chemical species emitted by diverse sources. The Positive Matrix Factorization (PMF) statistical model distinguishes correlation patterns among measured PM2.5 species to identify sources. Previous studies have applied source apportionment models to IMS-95 and CRPAQS data. For the present study, both CMB and PMF were applied to recent PM2.5 data collected in the San Joaquin Valley.

Prior Source Apportionment Studies

In earlier studies, Schauer and Cass, 2000 estimated source contributions to wintertime PM2.5 through CMB modeling of data collected during the IMS-95 field study. Chen et al., 2007, applied two types of multivariate statistical models, PMF and UNMIX, to identify sources contributing to wintertime PM2.5 during the CRPAQS field study. In addition, Chow et al., 2005, applied CMB to the CRPAQS data set. Table 3 summarizes the source contributions to wintertime PM2.5 estimated through these studies. In all cases, ammonium nitrate is the major source, contributing approximately 50 percent to wintertime PM2.5 throughout the Valley (23-site average); ranging from 40 and 50 percent at urban sites (Fresno and Bakersfield) to around 65 percent at rural sites (Kern Wildlife Refuge and Angiola). The combined biomass burning and cooking source, dominated by biomass burning, contributes over 25 percent of PM2.5

Table 3. Wintertime PM2.5 source contributions estimates for IMS-95 and CRPAQS.

Study and Sites	Source Contribution Estimates (% of PM2.5 mass)									
	Salt	Dust	Exhaust		Biom Burn	Cook	Amm. Sulfate	Amm. Nitrate	Sec Org[a]	Misc
			Gas	Dies						
IMS-95[1]										
Fresno avg. of 12/26-28/1995 and 1/4-6/1996	-	1.0	2.5	9.6	37.8	6.4	4.8	32.6	4.9	0.5
Bakersfield avg. of 12/26-28/1995 and 1/4-6/1996	-	1.5	3.4	9.5	18.6	5.1	7.5	41.6	12.1	0.7
Kern WR avg. of 12/26-28/1995 and 1/4-6/1996	-	0.9	0	5.0	0.5	0.0	7.9	66.8	15.6	3.2
CRPAQS, UNMIX[2]										
23-site avg. Nov. 2000 - Jan. 2001	0	3	15		24	5		51		2
CRPAQS, PMF[2]										
23-site avg. Nov. 2000 - Jan. 2001	0	5	10		23	3		48		11
CRPAQS, CMB[3]										
Fresno IOPs[4]	0.2	0.3	1.5	5.8	48.9		3.1	40.1		
Bakersfield IOPs[4]	0.2	1.2	6.4	4.5	30.4		3.9	53.5		
Angiola IOPs[4]	0.3	5.2	7.4	1.9	14.8		4.4	65.9		
Sierra Nevada Foothills IOPs[4]	0.2	1.2	4.0	7.4	41.8		4.7	40.6		

[1] Schauer and Cass, 2000.
[2] Chen et al., 2007.
[3] Chow et al., 2005.
[4] IOPs = Intensive Operating Periods, 12/15-18/200, 12/26-28/2000, 1/4-6/2001, and 1/31/2001- 2/3/2001.
[a] Secondary organic aerosol estimated from organic carbon not accounted for by primary source profiles.

valley wide, constituting the second major source at urban sites – with larger contributions at Fresno than at Bakersfield. In contrast, biomass burning and cooking are not a major sources at rural sites. Engine exhaust, dominated by diesel, is the third major source of directly emitted PM2.5, contributing approximately 10 to 15 percent to PM2.5 valley wide. Since secondary organics are estimated from the organic carbon not accounted for by the apportionment of other organic carbon sources, small changes in the organic carbon content in the chemical composition profiles for other sources may impact the estimate of the secondary organics contribution.

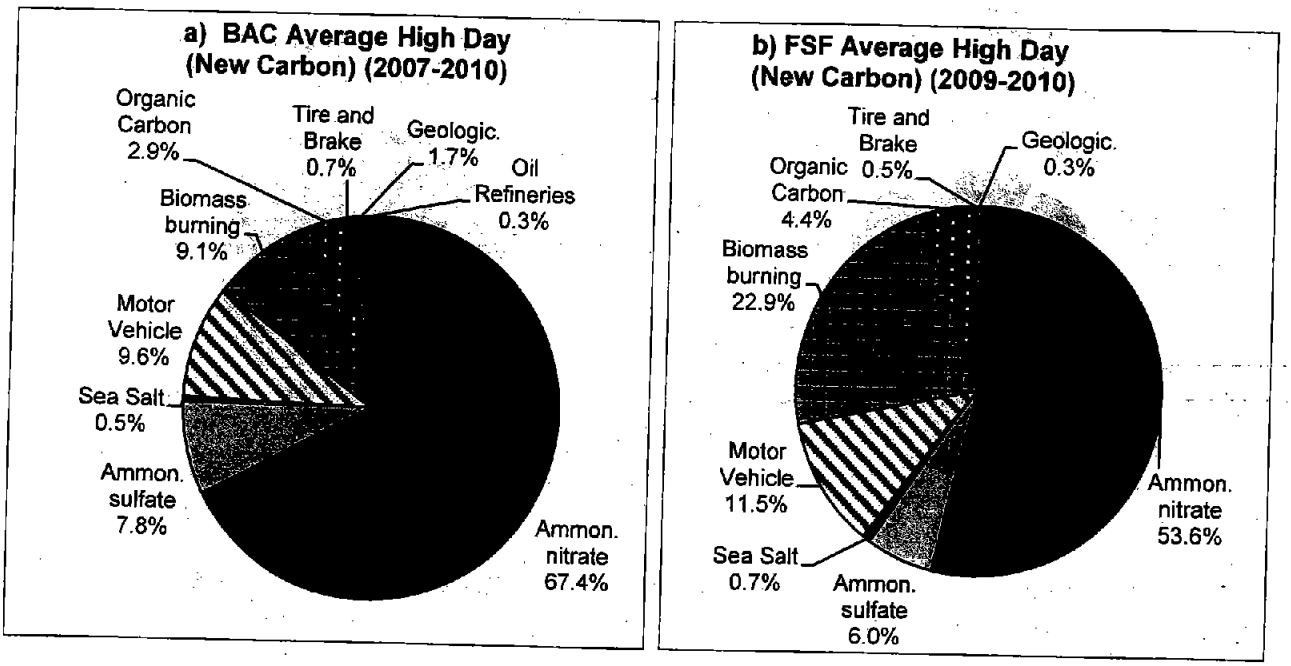
Recent Source Apportionment Studies

Chemical Mass Balance Modeling

Source contributions during high PM2.5 concentration days at Bakersfield-California (BAC) and Fresno–1st Street (FSF) were estimated by applying the CMB model version 8.2 to individual PM2.5 samples using PM2.5 source profiles developed during previous studies. The PM2.5 samples were from days measuring concentrations greater than 30 $\mu g/m^3$ between 2007 and 2010. Per U.S. EPA guidance, between 2007 and 2009, the carbon collection and analysis method was changed to improve comparability with the rural Interagency Monitoring of Protected Visual Environments (IMPROVE) PM2.5 carbon data. Since the new carbon method started operating in May 2007 at Bakersfield and in April 2009 at Fresno, the CMB analysis relied on 2007-2010 data from Bakersfield and 2009-2010 data from Fresno. Appendix 2 describes this CMB analysis in further detail.

Figure 29 shows the calculated contributions to ambient PM2.5 from sources included in the CMB model. Ammonium nitrate, the most significant source, contributed 67 percent at Bakersfield and 54 percent at Fresno-1st. Biomass burning, which included residential wood combustion and agricultural, prescribed burning, and likely also cooking, contributed nine percent at Bakersfield and 23 percent at Fresno. Motor vehicle exhaust (diesel and gasoline combined) accounted for ten percent at Bakersfield and 12 percent at Fresno-1st. Ammonium sulfate contributed eight percent at Bakersfield and six percent at Fresno-1st. Contributions of the remaining sources were minor at both sites.

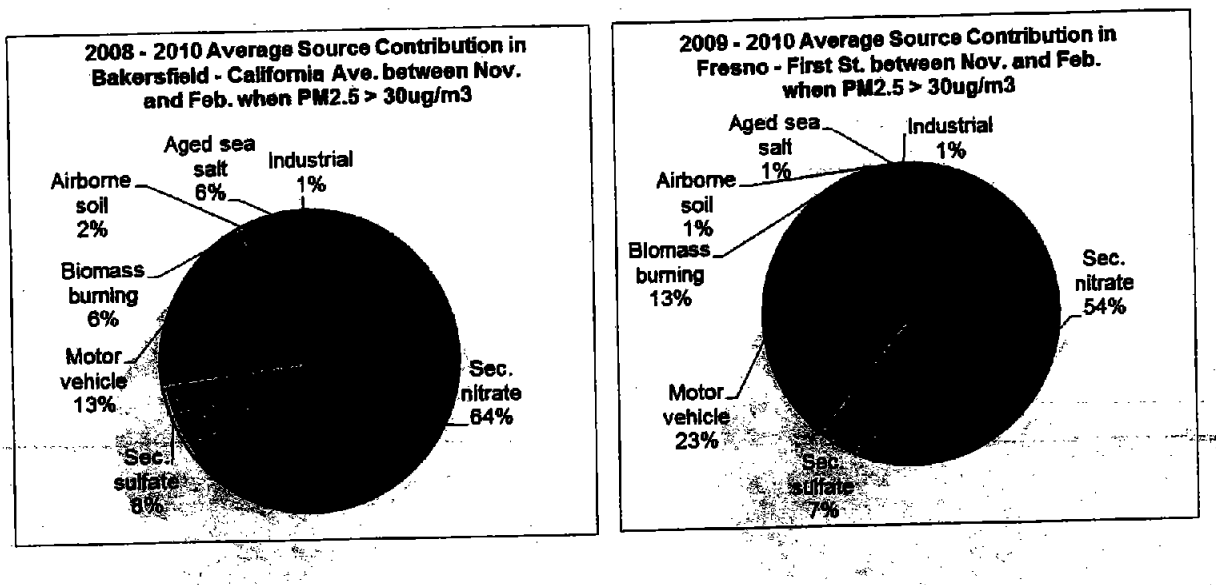
Figure 29. CMB model calculated 2007-2010 average PM2.5 source contributions of days with PM2.5 concentrations measuring over 30 µg/m^3 at a) Bakersfield-California (BAC) between 2007 and 2010 and b) Fresno-1st Street (FSF) between 2009 and 2010.



Positive Matrix Factorization

The PMF2 model was applied to the chemically speciated PM2.5 data collected at the Bakersfield-California and Fresno-1st Street monitoring sites. Bakersfield data from 2008-2010 and Fresno-1st data from 2009-2010 were used. Appendix 3 describes this PMF analysis in further detail. The average source contributions on days with PM2.5 concentrations measuring over 30 µg/m^3 are illustrated in Figure 30. Similar to the CMB results, ammonium nitrate contributes the most at both sites, 64 percent at Bakersfield and 54 percent at Fresno-1st. Motor vehicle exhaust contributes 13 percent at Bakersfield and 23 percent at Fresno-1st, while biomass burning (which includes residential wood combustion, agricultural burning, and likely also cooking) contributes six percent at Bakersfield and 13 percent at Fresno-1st. Secondary ammonium sulfate accounts for eight percent at Bakersfield and seven percent at Fresno-1st. Airborne soil and industrial sources are minor contributors.

Figure 30. Average high day source contributions estimated using PMF on days with PM2.5 concentrations measuring over 30 $\mu g/m^3$ at a) Bakersfield-California (BAC) between 2008 and 2010 and b) Fresno-1st Street (FSF) between 2009 and 2010.



While the absolute magnitude of the contributions estimated by the two models vary to some extent, taken together, the CMB and PMF source apportionment studies confirm the importance of secondary ammonium nitrate contributions to PM2.5 on high concentration days. In addition, motor vehicle exhaust and biomass burning were found to be significant contributors to primary PM2.5.

d. Photochemical modeling source apportionment

While observational models like CMB and PMF are most useful in identifying sources of primary PM2.5, photochemical models are needed to identify sources of secondary PM2.5. Ying et al. (2008, 2009) simulated the 2000/2001 CRPAQS PM2.5 episode using the source-oriented UCD-CIT air quality model. Source apportionment of primary PM2.5 in the SJV found elemental and organic carbon (EC and OC) to be the two largest components. Wood burning was the major OC source in the Valley, contributing approximately 50 percent to the total PM2.5. At Fresno, wood burning accounted for approximately 70 to 80 percent of the OC, while meat cooking accounted for approximately 10 to 15 percent. Diesel engines were identified as the major EC source. These results are generally consistent with those of the receptor modeling discussed above.

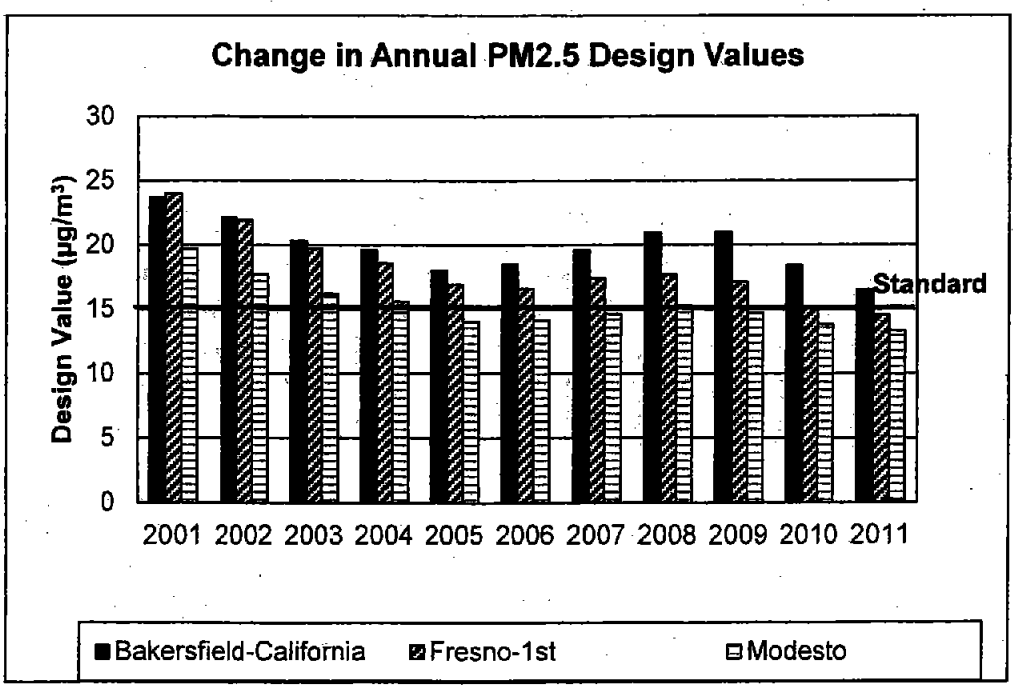
Source apportionment of secondary nitrate at Fresno revealed diesel engines were the largest contributor to nitrate, accounting for approximately 40 percent of the PM2.5 nitrate, while catalyst equipped gasoline engines accounted for approximately 20 percent. Agricultural sources accounted for approximately 80 percent of the PM2.5 ammonium.

8. PM2.5 AIR QUALITY PROGRESS

a. Annual PM2.5 trends

On an annual average basis, PM2.5 air quality has improved over the last ten years. As shown in Figure 31, annual design values at sites in the northern (e.g., Modesto), central (e.g., Fresno-1st) and southern regions (e.g., Bakersfield) in the Valley show progress towards attainment of the standard. The design value -- the metric used to determine compliance with the standard -- represents the average of three consecutive annual averages of the PM2.5 concentrations measured at a specific site (e.g. the 2011 PM2.5 annual design value is the average of the 2009, 2010, and 2011 annual average PM2.5 concentrations). If the annual design value is equal to or below 15.0 $\mu g/m^3$, the site attains the standard. Between 2001 and 2011, annual design values in the Valley declined between 30 and 40 percent. The largest decreases occurred in the northern and central Valley, where, based on 2011 design values, most sites attain the annual PM2.5 standard. While the southern Valley has shown less improvement, sites are nearing attainment, with design values about 10 to 20 percent over the standard. With on-going implementation of the 2008 PM2.5 Plan, air quality in the Valley is expected to continue to improve and reach attainment in 2014.

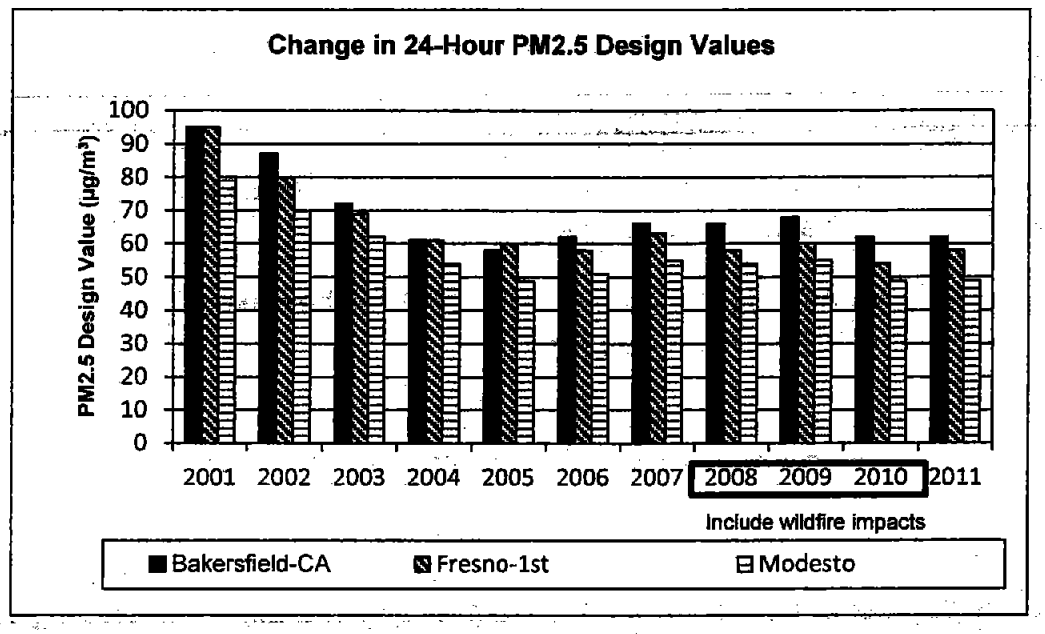
Figure 31. Trend in annual PM25 design values (2001-2011) at the Bakersfield-California, Fresno-1st, and Modesto monitoring sites.



b. 24-Hour PM2.5 trends

As illustrated in Figure 32, over the long-term, the 24-hour PM2.5 design values also show a downward trend. The most pronounced progress occurred between 2001 and 2003. Extensive wildfires occurred during the summer of 2008 in Northern California. These wildfires adversely impacted the 2008, 2009, and 2010 design values throughout the Valley, with a greater impact in the northern Valley. Overall, between 2001 and 2011, the 24-hour PM2.5 design values in the Valley have decreased between 30 and 55 percent.

Figure 32. Trend in 24-Hour PM2.5 Design Values (2001-2011) at the Bakersfield-California, Fresno-1st, and Modesto monitoring sites.

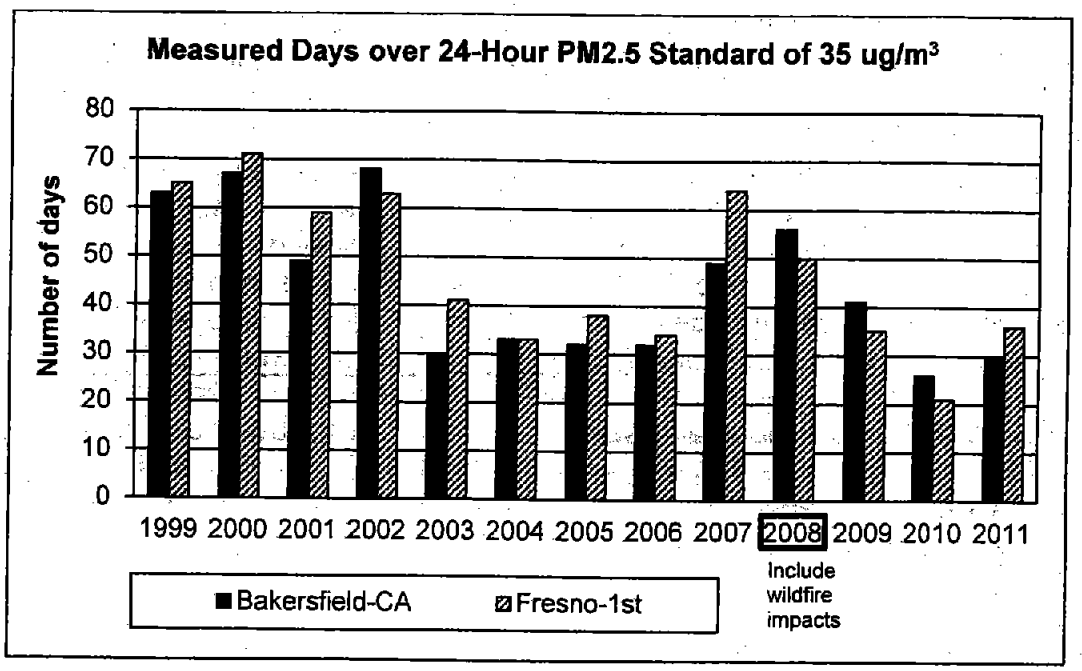


Meeting the PM2.5 24-hour standard poses a significant challenge because the focus is on the most severe days, which are strongly influenced by meteorology as well as emissions from episodic activities, such as residential wood burning. Thus, evaluating multiple PM2.5 air quality parameters and the meteorology effects on air quality trends provides a broader picture of progress in the Valley.

Looking at the number of days with measured PM2.5 concentrations over the 35 µg/m^3 standard provides another way to assess PM2.5 trends. Over the long term, between 1999 and 2011, the number of days exceeding the standard decreased by about 50 percent at the Bakersfield-California site and by about 45 percent at the Fresno-1st site (Figure 33). The increase in the number of exceedance days in 2011 compared to 2010 was due to the very severe meteorological conditions experienced in the Valley during the winter of 2011. The Valley experienced similar meteorological conditions during the 1999-2000 and 2000-2001 winters. The total number of exeedance days, however, was much higher during these earlier years, providing evidence that the

emission reductions achieved in the Valley have resulted in significant PM2.5 air quality improvement.

Figure 33. Trend in measured days over the 24-Hour standard of 35 µg/m^3 (1999-2011) at the Bakersfield-California and Fresno-1st monitoring sites.



c. Meteorology impacts on air quality

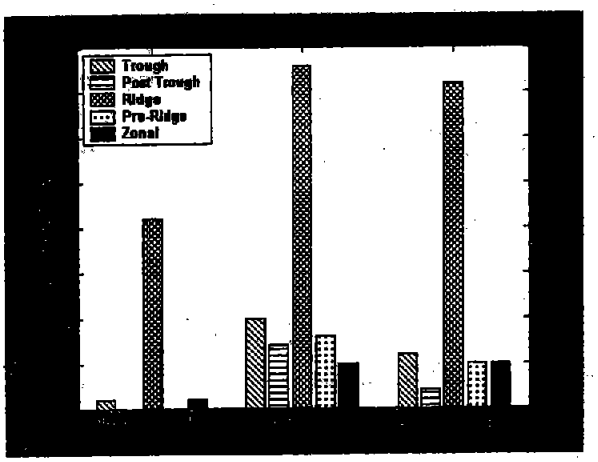
Although the San Joaquin Valley is large, almost 250 miles long and 80 miles wide, it has a reasonably uniform climatology characterized by hot, dry summers and cool, rainy winters. Mountains on the eastern, western, and southern edges create a long deep basin that can allow pollutants to accumulate under stagnant weather conditions.

The "Pacific High", a semi-permanent subtropical high pressure system located off the west coast of North America, and the "Great Basin High", a high pressure region that forms in the winter to the area east of the Sierra Nevada Mountains, are major influences on Valley weather, particularly in the winter. In turn, the strength and position of these high pressure regions are influenced by the strength of the El Nino/Southern Oscillation. El Nino years, characterized by warmer than normal temperatures in the equatorial Pacific and La Nina years, characterized by colder than normal temperatures, can alter the position of the Pacific High, allowing or blocking the passage of frontal systems through California and the San Joaquin Valley. A strong La Nina year can keep the Pacific High from moving south in the winter, diverting normal winter frontal systems northward, and resulting in drier conditions in California, particularly in the southern portions of the State. Due to decreases in the number and strength of frontal systems passing through the Valley, as well as increases in potential stagnant conditions, a strong La Nina year can result in higher than expected PM2.5 concentrations.

In a normal year, when the Pacific High moves south in winter and diminishes in strength, storms can penetrate further into the Valley, bringing clouds and rain. In between these storms, higher pressure can build, bringing mild, bright, sunny weather. A strong Great Basin High can direct winds into the Valley, cleaning out any accumulated particulates. When the Great Basin High is weak, cool, damp air can be trapped in the Valley, with stagnant conditions and poor ventilation lasting for days. The frontal systems which pass through the Valley in winter are weaker than those in the summer and the approach of a weak, slow-moving system can bring light surface winds with weak vertical mixing. The resulting stagnant conditions can persist for extended periods before the frontal system bringing precipitation and stronger winds finally passes through the area. The southern portion of the Valley is effectively blocked by the Tehachapis and the Coast Ranges to the south and west, leaving it dependent on frontal systems from the north for much needed precipitation and winds to scour out any accumulated pollutants. Stagnant conditions can lead to temperature inversions. Under normal conditions, temperature decreases with height, allowing free upward air flow and dispersion of emissions and pollutants. In contrast, a temperature inversion positions a layer of warm air above cooler air impeding upward air flow. Often the inversion layer is lower than the mountains surrounding the Valley providing a "cap" and effectively trapping pollutants. The frequency and intensity of the two high pressure systems and the speed and intensity of the periodic storm systems that clean the air are expected to cause large variations in year-to-year average wintertime PM2.5 concentrations.

Measurements conducted during the CRPAQS winter of 2000/2001 indicated that high PM2.5 concentrations usually occur during days dominated by a strong upper-level ridge of high pressure located over Central California (Figure 34) (MacDonald et al., 2006). These days are characterized by light winds, low mixing heights, and limited pollutant dispersion. These PM2.5 episodes can last weeks, making addressing the 24-hour PM2.5 standard in the Valley a significant challenge.

Figure 34. Frequency of high PM2.5 days in different regions of the San Joaquin Valley corresponding to different synoptic meteorological conditions during the CRPAQS winter of 2000/2001 (Mac Donald et al., 2006).



Examples of the impact of La Nina on Valley weather patterns can be seen during the winters of 2011/2012 and 2000/2001, the period during CRPAQS. As noted above, the winter of 2000/2001 was characterized by the persistence of strong surface high pressure that brought light-to-calm winds and stable, stagnant conditions to the Valley. Several fairly strong frontal systems crossed through the region, bringing precipitation, high wind speeds, and strong vertical mixing, allowing accumulated pollutants to disperse. The winter of 2011/2012 was also characterized by a strong surface high-pressure system, but frontal passages were weaker and drier with less vertical mixing, allowing stagnant conditions to continue for longer periods.

The graphs in Figures 35 and 36 compare PM2.5 concentrations measured at Bakersfield and Fresno, respectively, between November 1, 2011 and February 29, 2012 to the PM2.5 concentrations measured during the same four months (November through February) in earlier years (1999/2000 and 2000/2001). The 2011/2012 air quality was much better compared to earlier years for all air quality statistics. Peak 24-hour concentrations were over 40 percent lower. The average concentration during the four months period was also 40 percent lower. The number of days over the 24-hour standard of 35 $\mu g/m^3$ was cut by about 35 percent. Even more significant was the 70 percent decline in the number of days with very high concentrations (over 65 $\mu g/m^3$).

Figure 35. Comparison of the 2011/2012 PM2.5 episode to the CRPAQS episodes of 1999/2000 and 2000/2001 at Bakersfield-California.

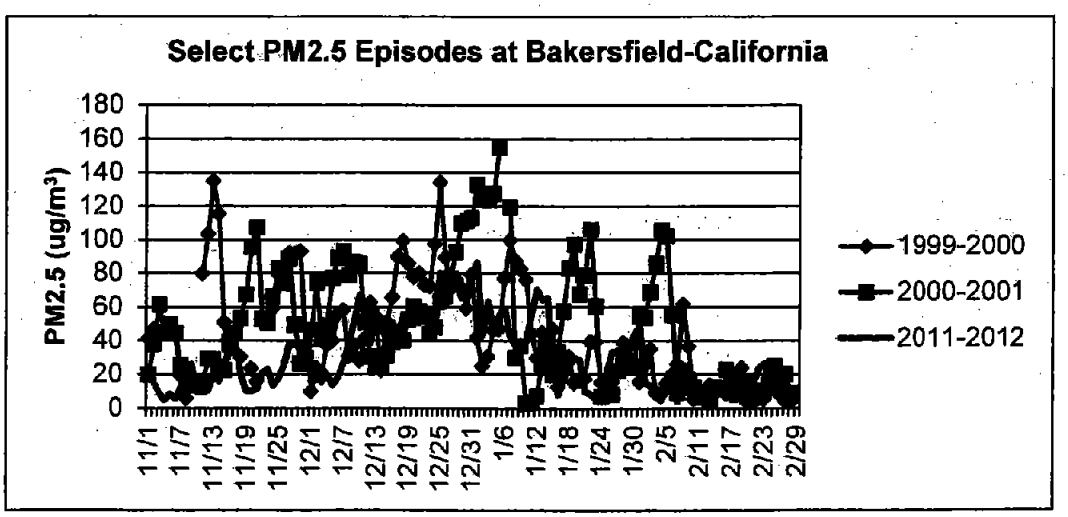
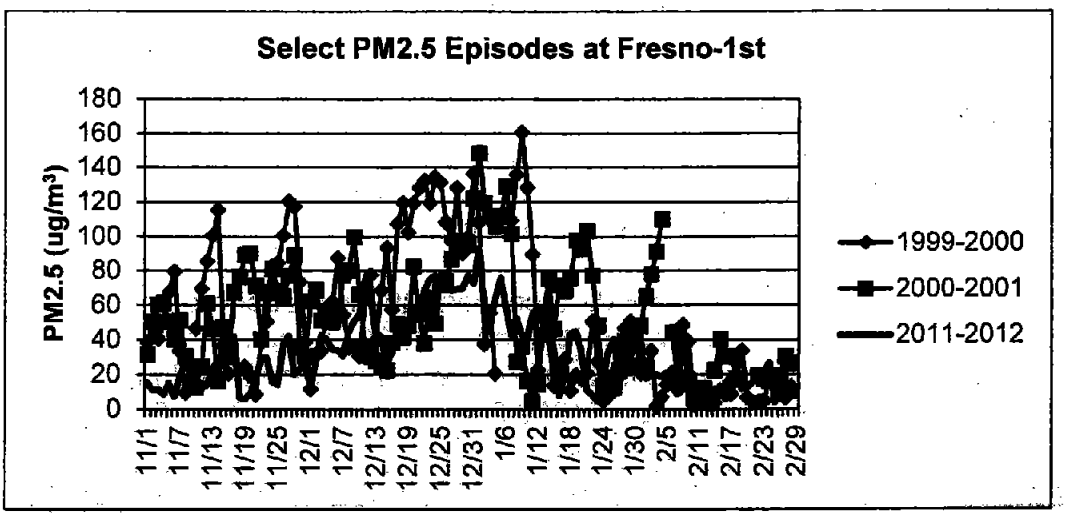


Figure 36. Comparison of the 2011/2012 PM2.5 episode to the CRPAQS episodes of 1999/2000 and 2000/2001 at Fresno 1st.



d. Annual trends adjusted for meteorology

To understand the effects of emission reductions on ambient PM2.5 concentration trends, the effects of meteorology need to be separated out as fully as possible. The Classification and Regression Trees (CART) method was used for this purpose in the SJV. CART-defined relationships developed for Bakersfield and Fresno accounted for most, but not all, of the effects of meteorology on the annual PM2.5 trends. One aspect that may not have been fully captured was the role of carryover of PM2.5 during extended duration episodes. Further analysis is underway to better address this impact within the CART analysis. Appendix 4 describes the current CART analysis in further detail.

The meteorology-adjusted (met-adjusted) trends in the figures below integrate the CART-defined meteorology-effects. For example, in years with meteorology conditions more conducive to PM2.5 formation, the PM2.5 concentrations were adjusted downward. Conversely, the PM2.5 concentrations were adjusted upward in years with meteorology conditions less conducive to PM2.5 formation.

Met-adjusted trends are designed to be better indicators than the observed trends for showing the effects of changing emissions. At Bakersfield, the resulting meteorology-adjusted trend between 1999 and 2010 indicates greater decline in PM2.5 concentrations than the unadjusted trend (Figure 37), while at Fresno the two trends are generally similar (Figure 38). Overall, the meteorology-adjusted trends indicate that between 1999 and 2010, the annual average PM2.5 concentrations decreased about 40 to 50 percent at both locations due to emission reductions.

Figure 37. Observed and met-adjusted PM2.5 trends in Bakersfield.

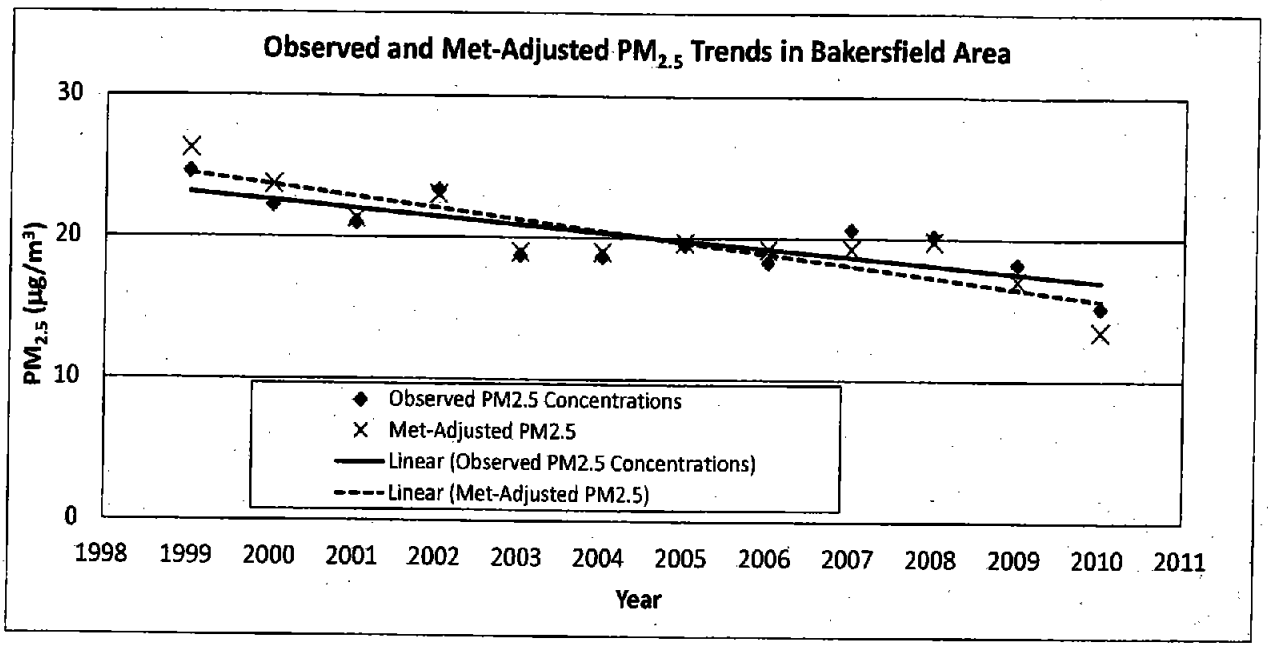
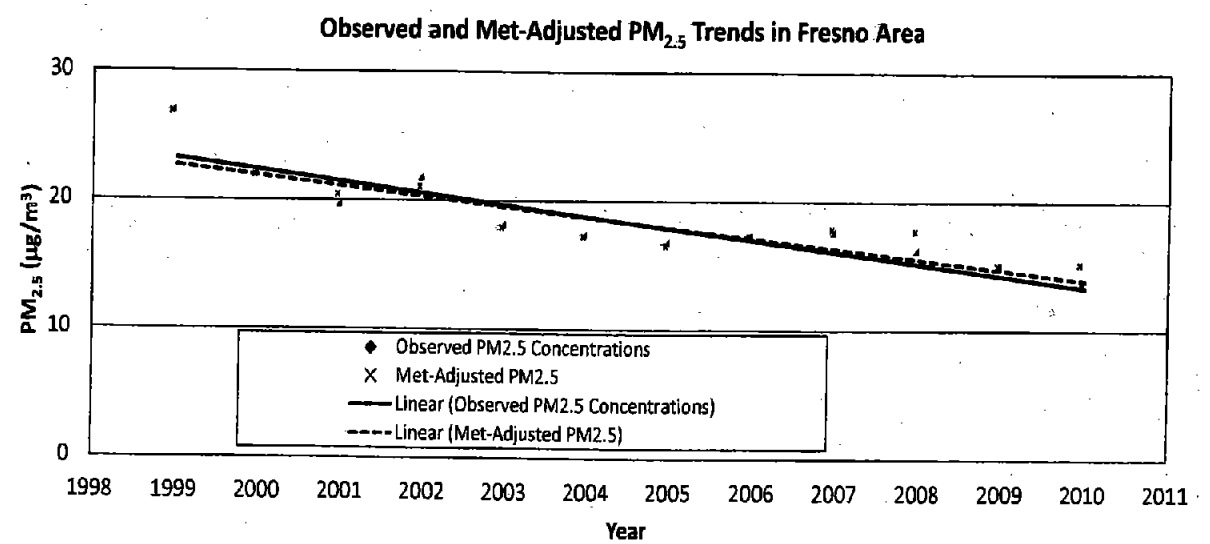


Figure 38. Observed and met-adjusted PM2.5 trends in Fresno.



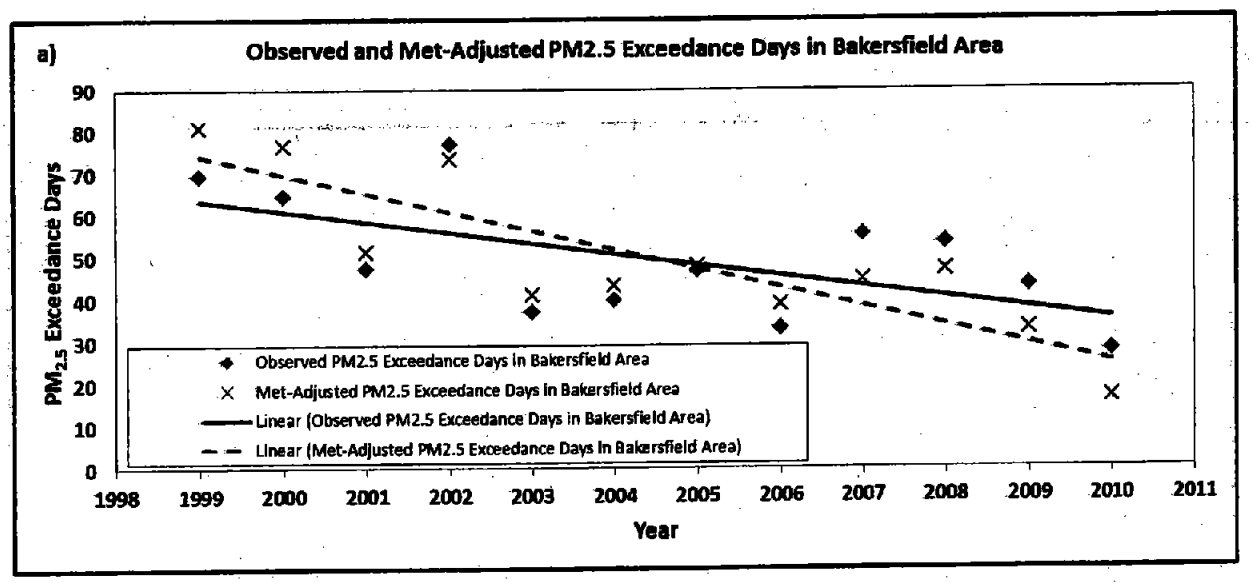
e. 24-hour trends adjusted for meteorology

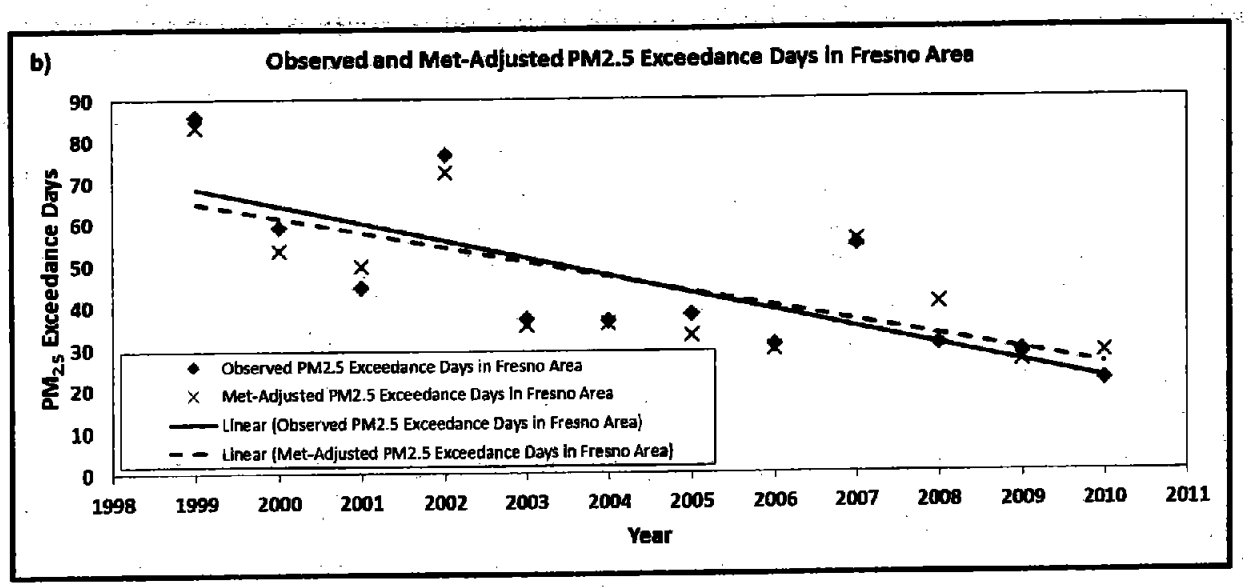
Similar to annual average trends, the number of exceedance days that occur each year can be strongly affected by differences in meteorological conditions from year to year. Figure 39 shows observed and met-adjusted trends for PM2.5 exceedance days in the Bakersfield and Fresno areas. The observed values each year may differ from those in

Figure 33 for several reasons including a) they are averages of multiple sites in each area, b) more days could be included where missing values could be imputed (missing values were filled in using relationships in existing data), and c) some days with incomplete meteorological data could not be included in the analysis.

The met-adjusted trend for Bakersfield shows a stronger decline compared to the observed trend, while in Fresno the observed and met-adjusted trends are similar. The decrease from 1999 through 2010 for the met-adjusted trend is 60 to 65 percent in both areas.

Figure 39. Observed and met-adjusted trends for PM2.5 exceedance days in a) the Bakersfield area and b) the Fresno area.

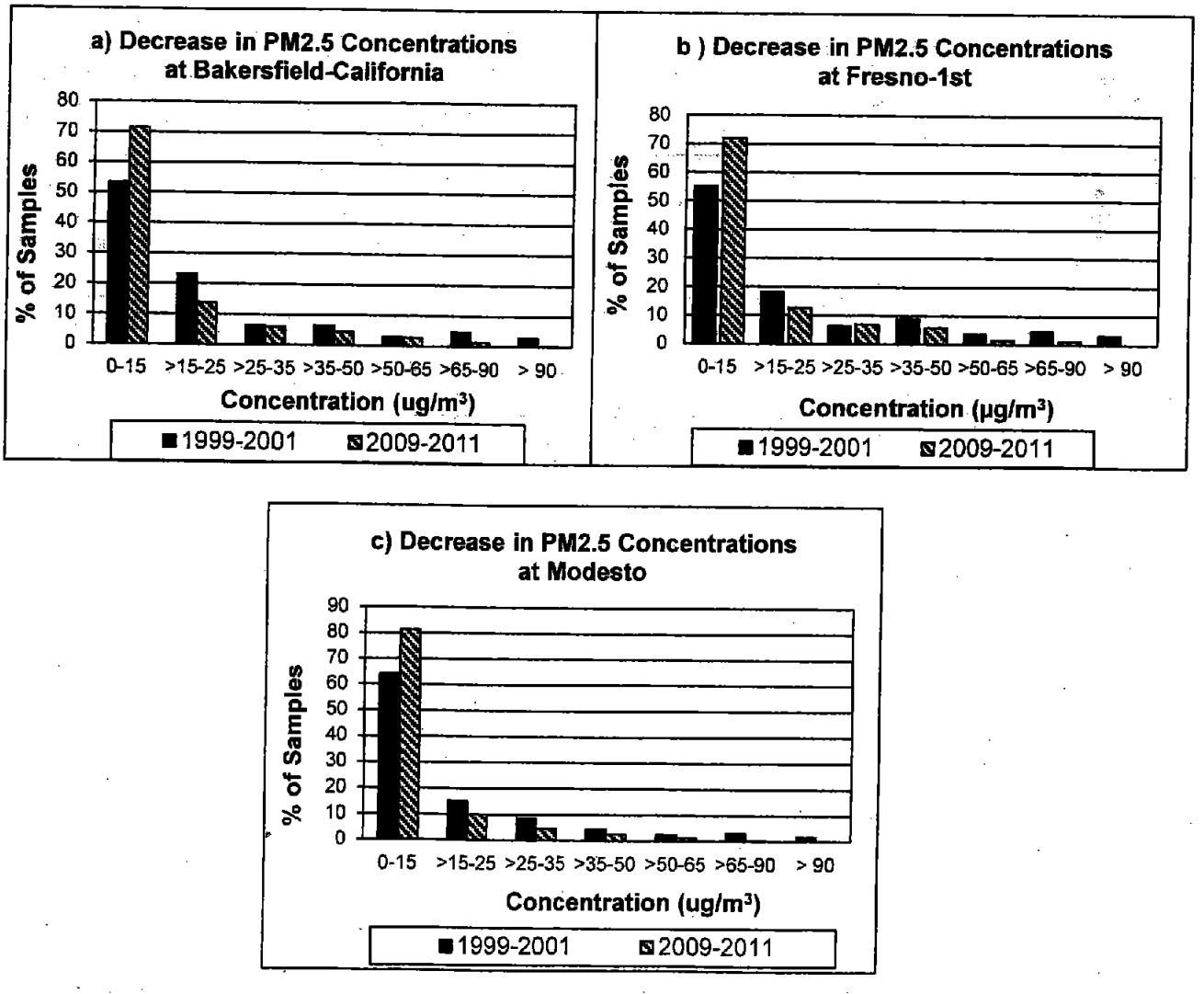




f. Trends in 24-hour, seasonal, and hourly PM2.5

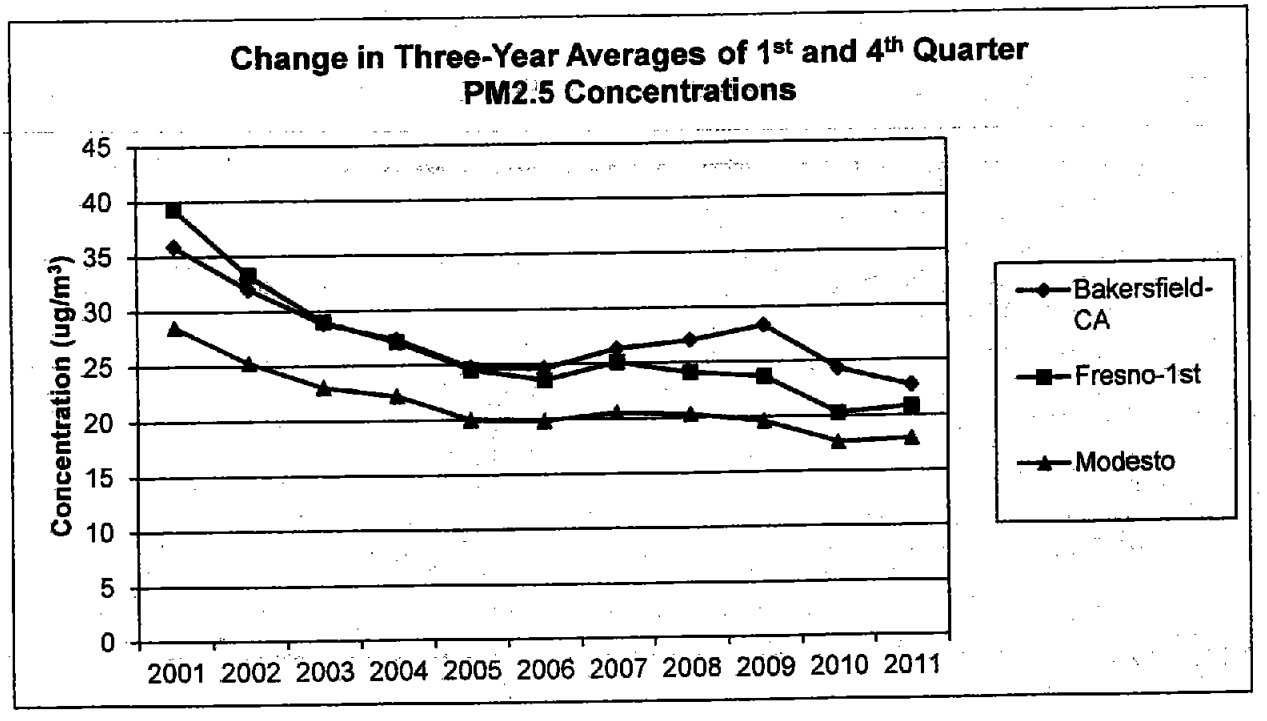
Comparing the change in the frequency distribution of 24-hour PM2.5 concentrations over the last decade provides another means of looking at air quality changes over the years. As illustrated in Figure 40, the fraction of days recording PM2.5 over the 24-hour standard of 35 $\mu g/m^3$ decreased between the three-year periods of 1999-2001 and 2009-2011 at the three monitoring sites shown. At Bakersfield, the frequency decreased from over 15 to less than ten percent, at Fresno from 20 to less than ten percent, and at Modesto from about ten percent to less than five percent. In contrast, during these same periods, the fraction of days recording concentrations at or below the annual standard increased from about 50 up to 70 percent at Bakersfield, from 55 up to 70 percent at Fresno, and from about 65 up to 80 percent at Modesto.

Figure 40. Change in PM2.5 concentration frequency distribution between the 1999-2001 and 2009-2011 periods at the a) Bakersfield-California, b) Fresno-1st, and c) Modesto monitoring sites.



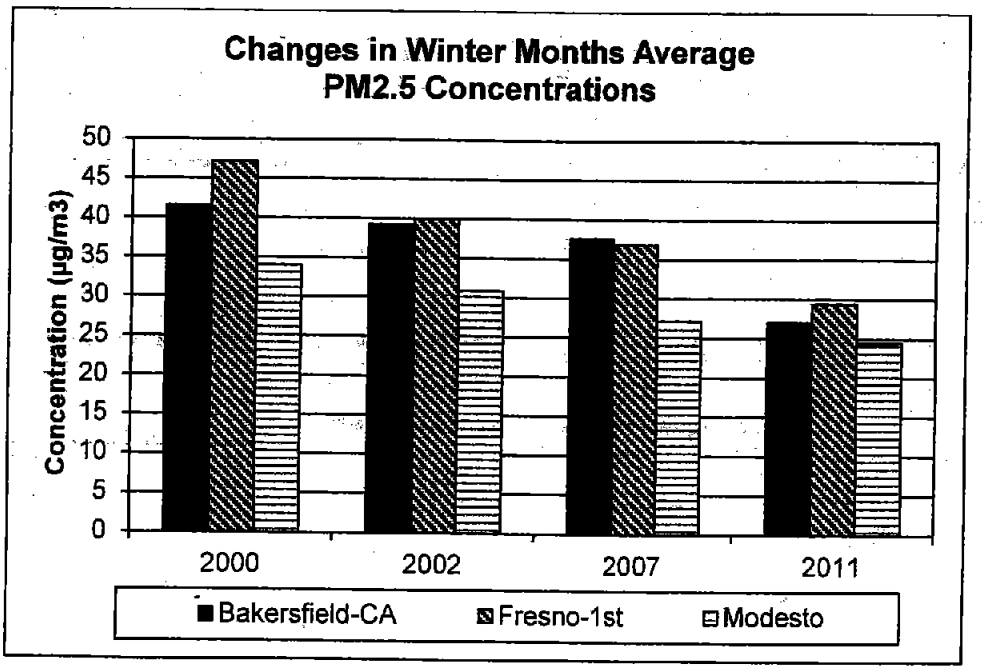
In the San Joaquin Valley, PM2.5 concentrations over the 24-hour standard occur during the winter season. Figure 41 illustrates the overall downward trend in the three-year averages of 1st and 4th quarter (Q1+Q4) PM2.5 concentrations between the periods of 1999-2002 and 2009-2011. Over the long-term, Q1+Q4 average PM2.5 concentrations decreased by 37 percent at Bakersfield and Modesto and 47 percent at Fresno. Most recently, between the periods of 2004-2006 and 2009-2011, Q1+Q4 average PM2.5 concentrations decreased by eight percent at Bakersfield, 11 percent at Fresno, and ten percent at Modesto.

Figure 41. Change in three-year averages of 1st and 4th quarter PM2.5 concentrations at the Bakersfield-California, Fresno-1st, and Modesto monitoring sites.



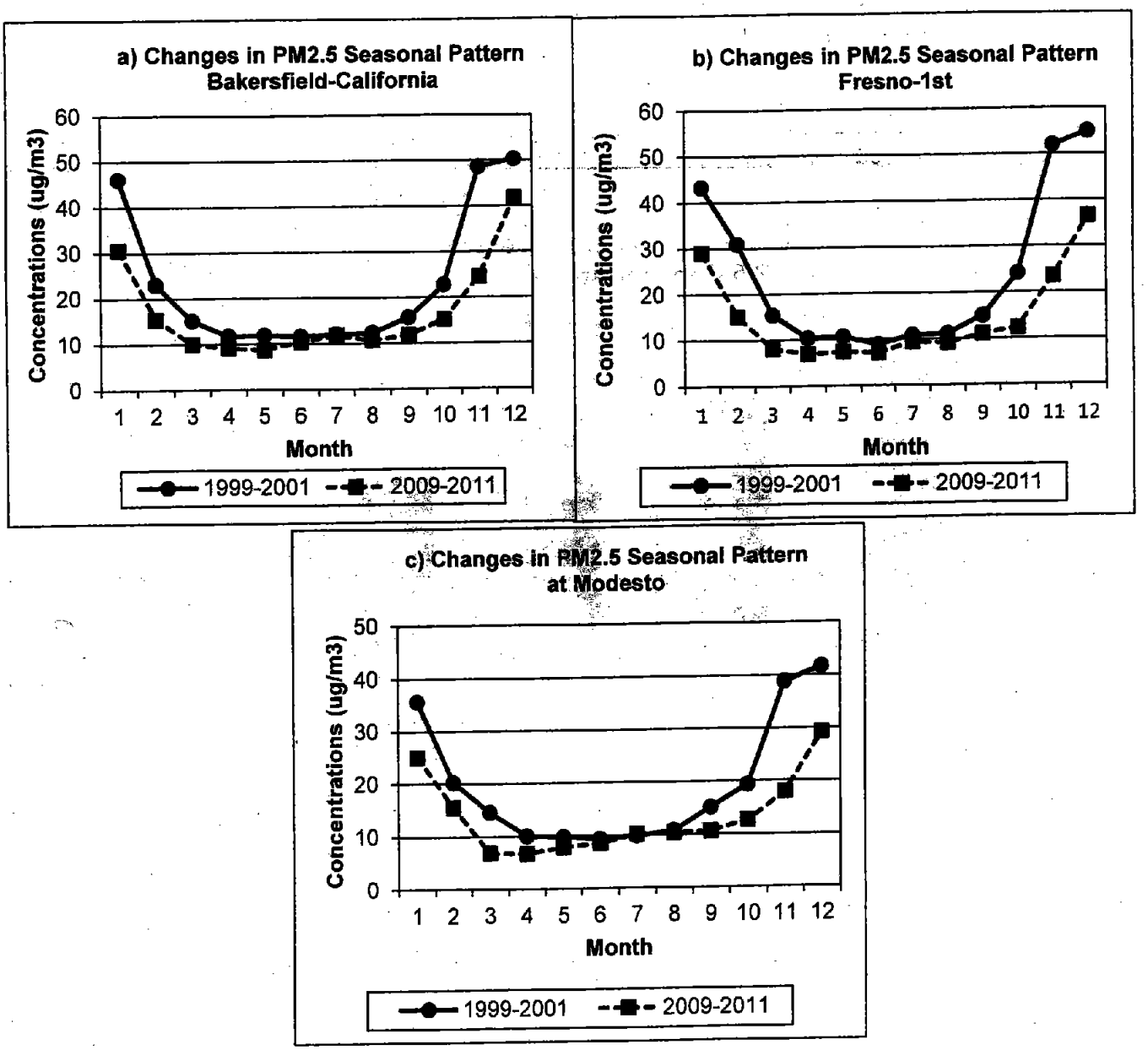
Focusing on changes in winter (November through February) average PM2.5 concentrations in years when meteorological conditions were most conducive to PM2.5 formation and accumulation provides further insight into PM2.5 air quality progress. These years include 2000, 2002, 2007, and 2011, which as illustrated on Figure 33, also had the highest numbers of days measuring over the 24-hour PM2.5 standard. Figure 42 illustrates the decrease in the winter average PM2.5 concentrations in these four years at the Bakersfield-California, Fresno-1st, and Modesto monitoring sites. Comparing 2000 to 2011, winter average PM2.5 concentrations decreased by about 35 percent in Bakersfield, about 40 percent in Fresno, and about 30 percent in Modesto. Comparing the more recent years of 2007 and 2011, winter average PM2.5 concentrations decreased by about 30 percent in Bakersfield, 20 percent in Fresno, and ten percent in Modesto.

Figure 42. Changes in winter-months average (January, February, November, December) PM2.5 concentrations at the Bakersfield-California, Fresno-1st and Modesto monitoring sites among years with most PM2.5 conducive meteorology.



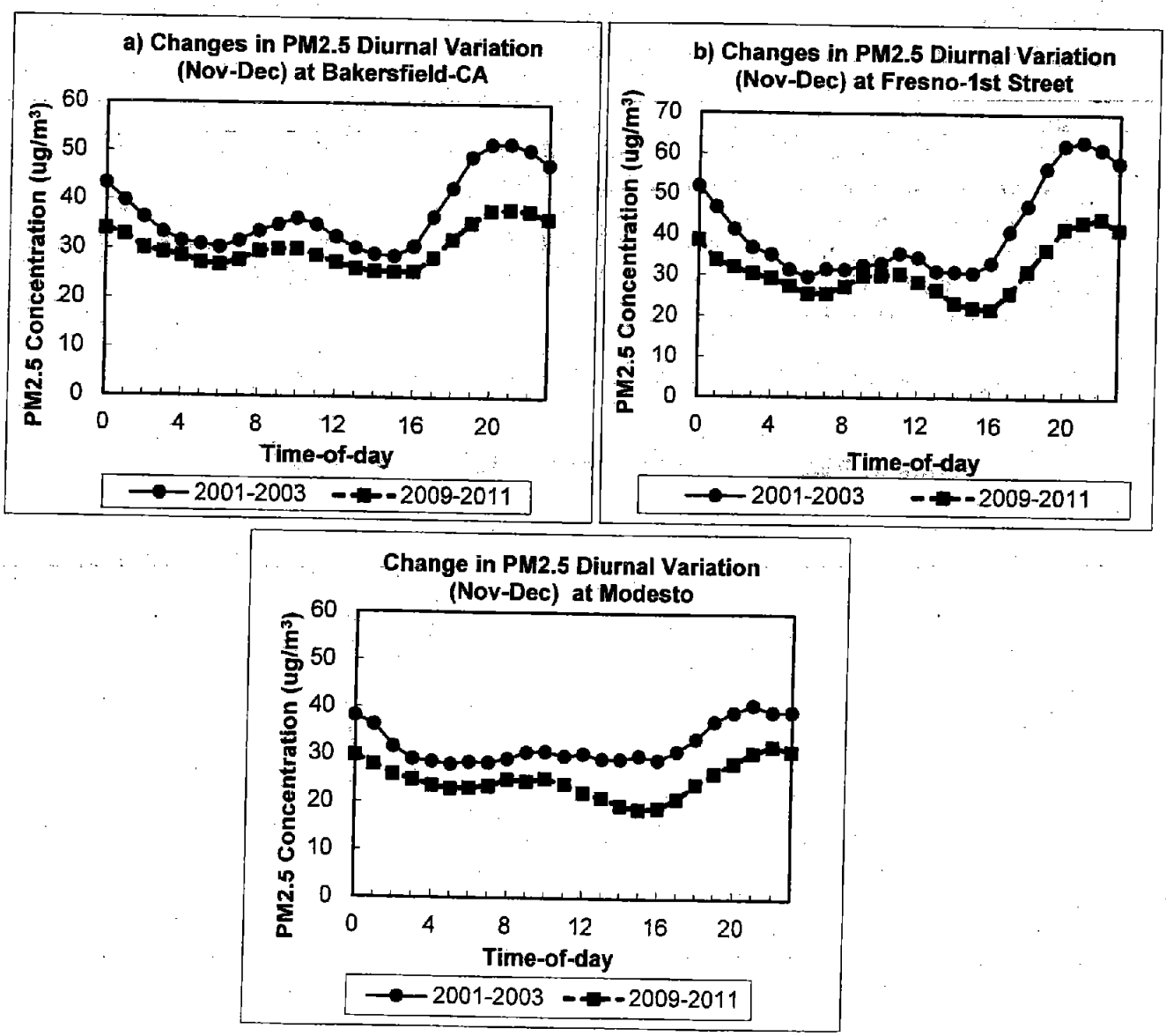
Progress in PM2.5 is further corroborated by comparing changes in monthly average PM2.5 concentrations between 1999-2001 and 2009-2011 (Figure 43). The overall PM2.5 seasonal pattern has not changed; however the average monthly concentrations have decreased. The most significant improvements in PM2.5 have been achieved during the winter months.

Figure 43. Changes in PM2.5 monthly concentrations between the 1999-2001 and 2009-2011 three-year periods at the a) Bakersfield-California, b) Fresno-1st, and c) Modesto monitoring sites.



Comparing changes in PM2.5 diurnal patterns offers further insights into the progress achieved. Figure 44 illustrates changes in the three-year averages of hourly PM2.5 concentrations recorded during November and December between 2001-2003 and 2009-2011 at a) Bakersfield-California, b) Fresno-1st, and c) Modesto. The overall diurnal patterns have not changed, yet hourly concentrations have decreased throughout the day. Peak daytime concentrations decreased approximately 20 percent, and peak nighttime concentrations approximately 30 percent.

Figure 44. Changes in the average November-December PM2.5 hourly concentrations between the 1999-2001 and 2009-2011 three-year periods at the a) Bakersfield-California, b) Fresno-1st, and c) Modesto monitoring sites.



g. Chemical composition trends

As previously discussed, PM2.5 concentrations measured at monitoring sites in the SJV have decreased from the 1999-2001 to the 2009-2011 three-year periods. Trends in individual PM2.5 chemical components, as well as emission inventory trends were evaluated to highlight the main chemical components leading to the progress in PM2.5 air quality and to evaluate the response to State and District control programs.

Speciation monitors in the SJV collect data on PM2.5 chemical composition. Figures 45, 46, and 47 illustrate the trends in the individual PM2.5 components at Bakersfield, Fresno, and Modesto. Between 2007 and 2009, the carbon collection and analysis method was changed to improve comparability with the rural IMPROVE PM2.5 carbon data. Since the change was implemented mid-year, there are gaps in carbon data for years with a mix of the old and new methods.

Ammonium nitrate, ammonium sulfate, and carbon compounds are the major constituents of PM2.5. On an annual average basis, concentrations of these key constituents have all shown significant decreases. Ammonium nitrate concentrations in the Valley declined about 40 percent between 2002 and 2011. During the same time-frame, concentrations of ammonium sulfate and carbon compounds declined about 20 to 30 percent. The most significant declines occurred between 2002 and 2003, and again between 2007 and 2010.

Figure 45. Trends in PM2.5 chemical components at Bakersfield.

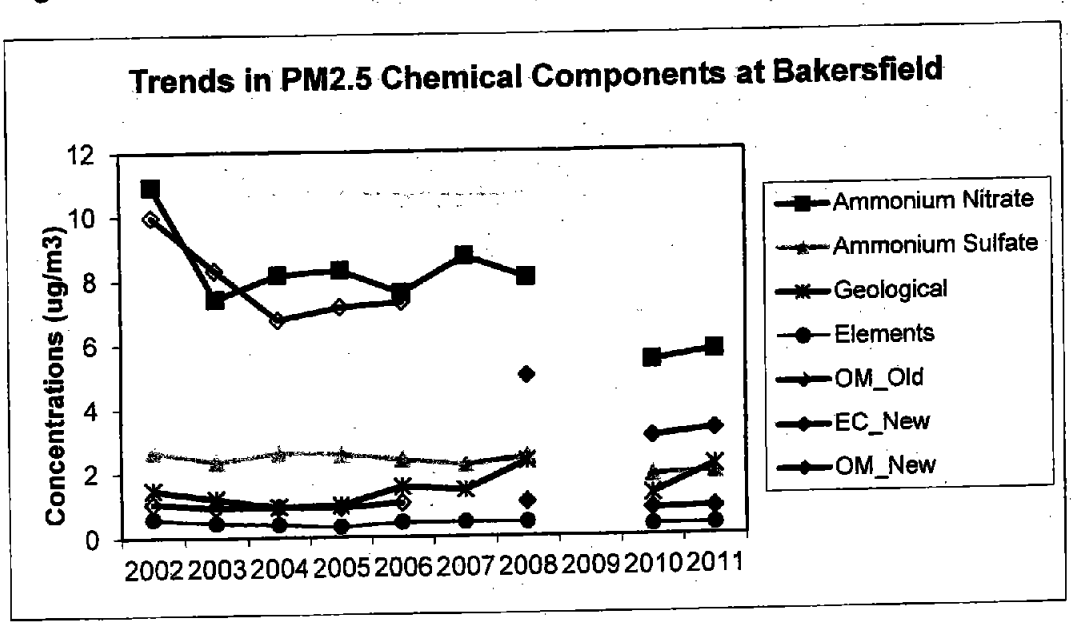


Figure 46. Trends in PM2.5 chemical components at Fresno-1st.

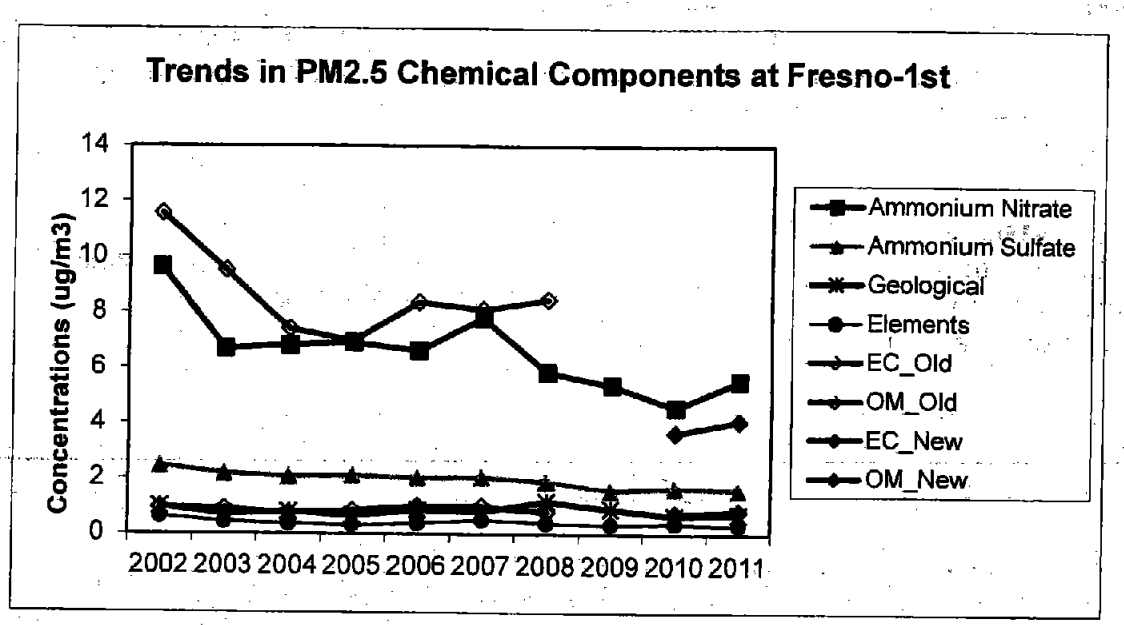
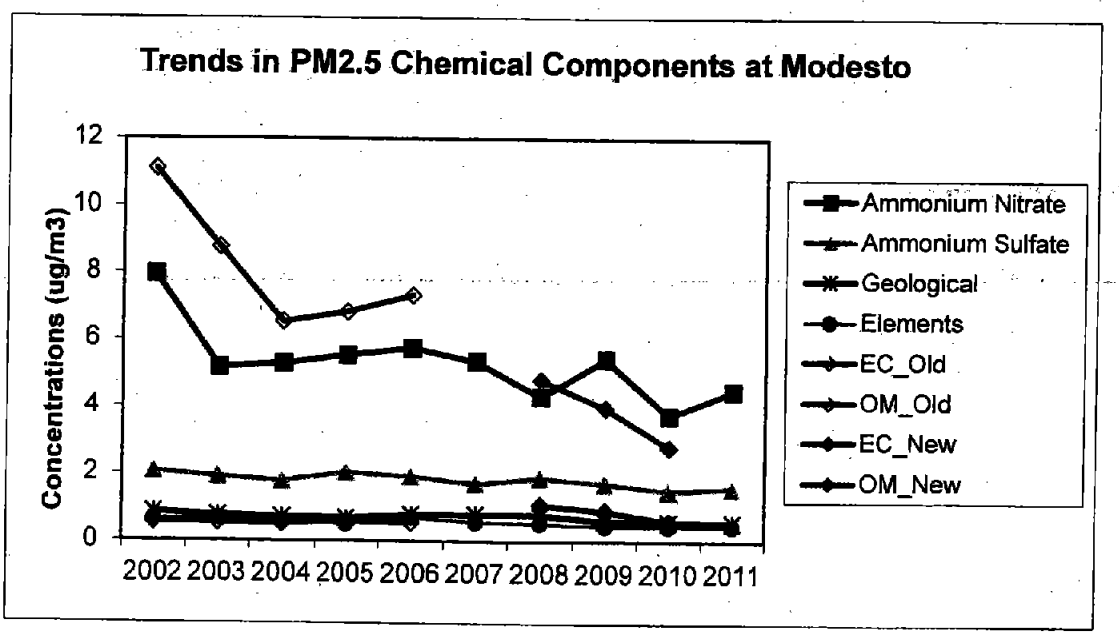


Figure 47. Trends in PM2.5 chemical components at Modesto.



The 2012 SJV PM2.5 Plan's Appendix A describes further analyses on PM2.5 air quality trends.

h. Emission inventory trends

As specified by U.S. EPA's PM2.5 implementation rule, required PM2.5 plan precursors are directly emitted PM2.5, NOx, and SOx. As discussed in sections 5 and 6, VOCs and ammonia are not significant precursors in terms of reducing PM2.5 concentrations. Figure 48 illustrates wintertime emission trends in the San Joaquin Valley air basin from 2000 through 2011 for the three key precursors.

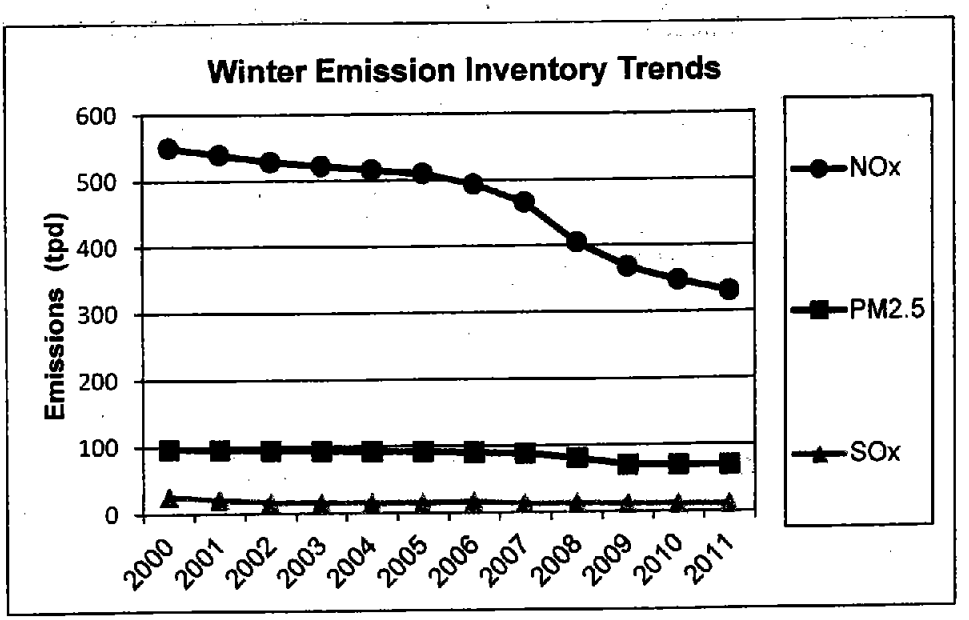
- NOx emissions have decreased by 219 tons per day (tpd) or 40 percent. Major reductions occurred in emissions from heavy-duty diesel trucks, stationary combustion sources, and other mobile sources (e.g., farm and off-road equipment, trains)

- Direct PM2.5 emissions decreased by 28 tpd or about 30 percent. Major reductions occurred in emissions from residential wood combustion and entrained dust.

- SOx decreased by 15 tpd or about 60 percent. Major reductions occurred in emissions from stationary fuel combustion sources and industrial processes.

The combined downward trends in PM2.5 components and emissions of PM2.5, NOx, and SOx indicate that the ongoing control program has had substantial benefits in improving air quality in the SJV and that further emission reductions in the future are expected to provide continuing progress towards attaining the 24-hour PM2.5 standard.

Figure 48. PM2.5 and PM2.5 precursor winter emission trends in the San Joaquin Valley.



9. LINKING AIR QUALITY TRENDS TO EMISSION REDUCTIONS

a. NOx control

Programs aimed at reducing NOx emissions have played an important role in reducing nitrate concentrations and, consequently, overall PM2.5 concentrations in the Valley. As discussed in section 5, previous studies have identified NOx as the limiting precursor for ammonium nitrate formation. As a result, NOx emissions and PM2.5 nitrate levels track each other over the years. Trends in estimated NOx emissions, as well as monitored ambient concentrations, are compared with trends in measured PM2.5 nitrate concentrations. As illustrated in Figure 49, between 2004 and 2011, Valley NOx emissions decreased by about one third, with a commensurate reduction of 30 percent in PM2.5 nitrate concentrations. Furthermore, the reductions in NOx emissions were also reflected in the corresponding reduction in the ambient gaseous NOx concentrations. Figures 50 and 51 show a strong correlation between trends in PM2.5 nitrate concentrations and ambient NOx concentrations at the Bakersfield and Fresno sites. Between 2004 and 2011, concentrations of both PM2.5 nitrate and NOx decreased approximately 30 percent.

Figure 49. Comparison between trends in Valley wide winter average NOx emission and PM2.5 nitrate concentrations at Bakersfield and Fresno. Emissions and concentrations are presented as three-year winter averages.

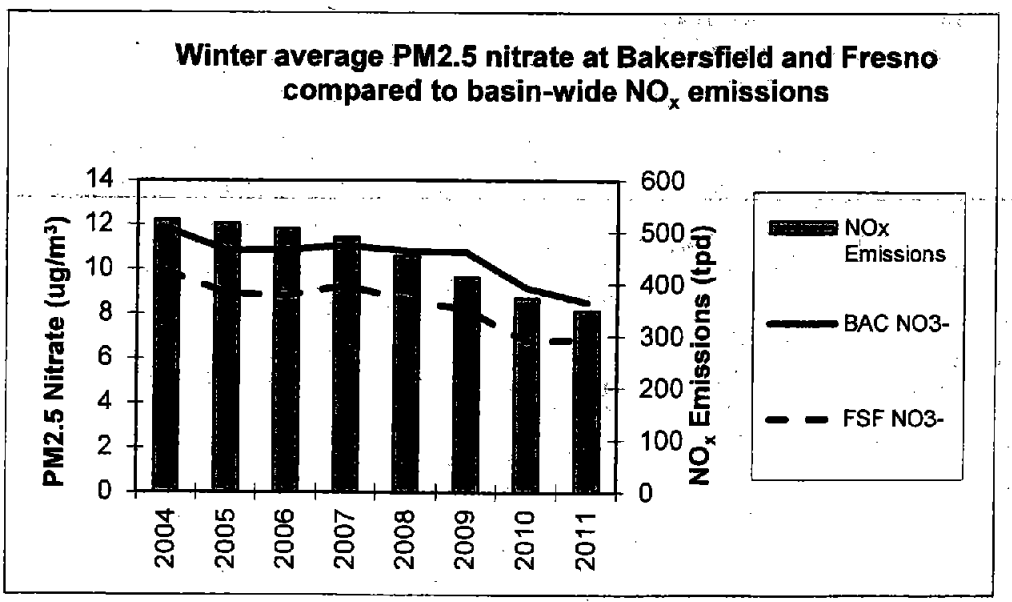


Figure 50. Comparison of trends in wintertime PM2.5 nitrate and NOx concentrations in Bakersfield. Concentrations are presented as three-year winter averages.

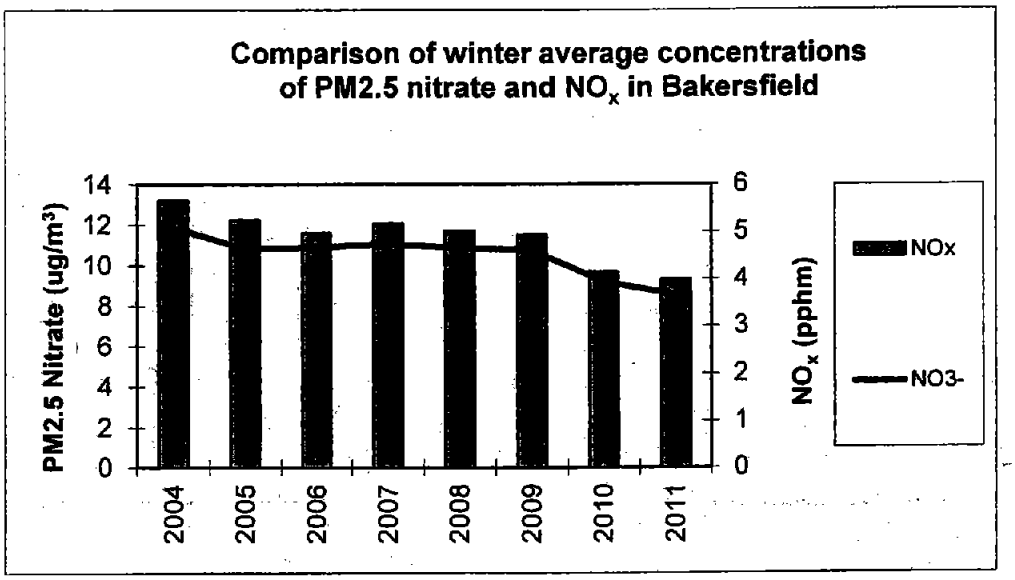
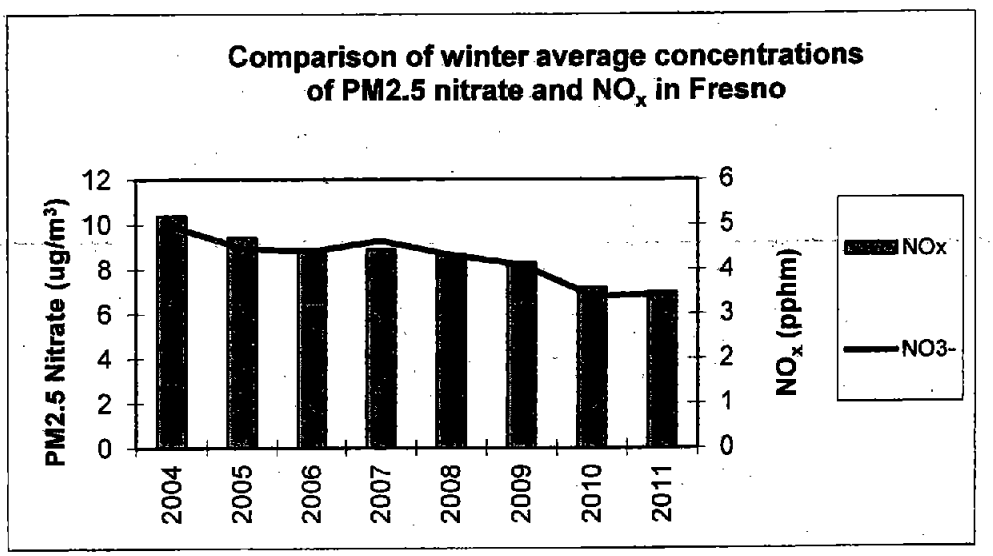
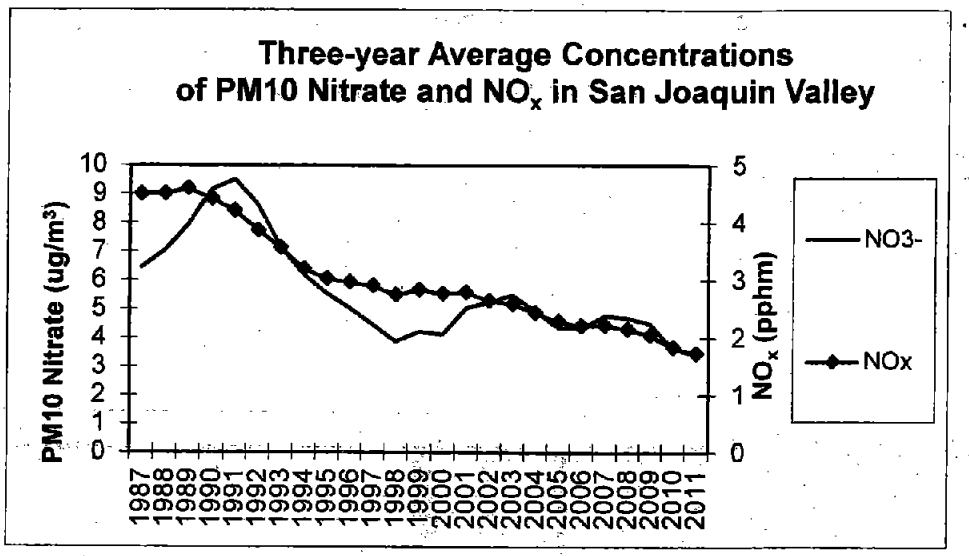


Figure 51. Comparison of trends in wintertime PM2.5 nitrate and NOx concentrations in Fresno. Concentrations are presented as three-year winter averages.



Because the PM2.5 chemical speciation network is just over ten years old, data from the PM10 ion analysis network were also used to assess longer-term trends. Although, the earlier data do not meet the strict quality assurance/quality control requirements of the PM2.5 chemical speciation network, they do provide a historical perspective. The highest PM10 nitrate concentrations were measured in the Valley in early 90's. Since then, concentrations of both PM10 nitrate and NOx have decreased about 60 percent (Figure 52). The yearly variability in the ammonium nitrate concentrations reflects the effects of the varying meteorology on ammonium nitrate formation.

Figure 52. Long-term trends in three-year average concentrations of PM10 nitrate and NOx in the San Joaquin Valley.



b. Residential wood burning controls

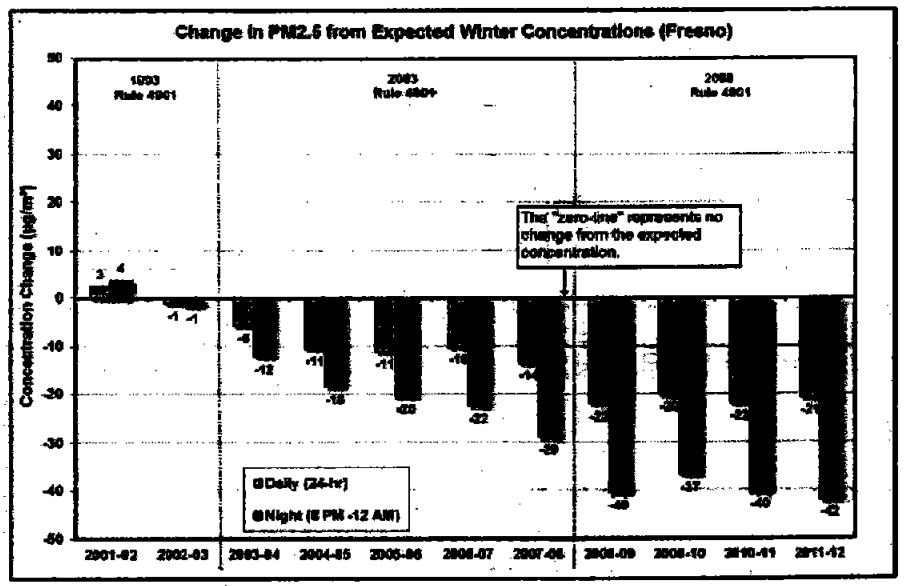
As previously discussed, annual average concentrations of PM2.5 carbon components have decreased about 20 to 30 percent since 2002. The decrease in the carbon component reflects substantial benefits from the implementation of District Rule 4901, which prohibits residential wood-burning on days when high concentrations of PM2.5 are predicted. In addition, as part of the District's stringent smoke management program, agricultural burning is prohibited on those same days. Through a series of Rule 4901 amendments, the PM2.5 threshold for calling no-burn days was established in 2003 at 65 µg/m^3 and subsequently tightened to 30 µg/m^3 in 2008. District staff analyzed the effect that Rule 4901 has had on PM2.5 in the Fresno area using a statistical model developed to quantify PM2.5 reductions attributable to the 2003 and 2008 rule amendments. Based on PM2.5 concentration relationships to meteorological variables before the wood-burning curtailments came into effect, the model predicts what the PM2.5 concentrations would have been if the curtailments had not been adopted. These expected concentrations are then compared to the measured concentrations. This analysis is further described in the 2012 SJV PM2.5 Plan's Appendix A.

The analysis results indicate that as of the 2011-2012 wood-burning season, 24-hour average PM2.5 levels in Fresno have improved by 41 percent (21 µg/m^3) since the 2003 and 2008 amendments to Rule 4901 (Figure 53). This improvement is especially marked in PM2.5 concentrations measured during the evening hours of 8:00 p.m. to 12:00 a.m. The average evening PM2.5 concentrations have improved by 50 percent (42 µg/m^3) over the same time period. As shown in this analysis, the 2008 amendment

to Rule 4901 has approximately doubled the seasonal improvements in PM2.5 attributable to the 2003 amendments.

Rule 4901 will continue to play an important role in reducing PM2.5 concentrations throughout the San Joaquin Valley both within and beyond the timeframe of this plan.

Figure 53: Effect of SJVAPCD's Rule 4901 on PM2.5 concentrations in Fresno.



10. MODELED ATTAINMENT DEMONSTRATION

a. Modeling results

Consistent with U.S. EPA guidelines, air quality modeling was done to predict future PM2.5 concentrations at each monitoring site in the San Joaquin Valley. This modeling shows attainment of the 24-hour PM2.5 standard by 2019 in all counties except Kings and Kern, based on implementation of the ongoing control program. In these counties, additional focused emission reductions are needed to provide for attainment. As required by U.S. EPA, additional analyses has been done to confirm that attainment is predicted throughout each county (i.e. in each modeled grid cell). The "Attainment Demonstration" chapter of the District's plan provides an overview of the photochemical modeling performed. Additional information on the periods modeled, the models selected, and model application can be found in the Modeling Protocol document prepared for this effort.

The air quality modeling analysis includes new emission reductions each year between now and 2019 from implementation of a combination of adopted ARB and District programs. As a result, most sites in the northern and central Valley are expected to attain by 2019. As required by U.S. EPA, the modeling replicates the base year 2007 meteorological conditions for each calendar day in the year 2019. The 2007 meteorological conditions included several periods of time especially conducive to the formation of PM2.5.

Given the past effectiveness of District programs to curtail residential wood burning, ARB staff then modeled a scenario with an enhanced curtailment program, which would be designed to prevent wood burning on days that may lead up to a PM2.5 exceedance. The modeling results for this scenario indicate that only one site (Bakersfield-California) would not attain the standard with this additional level of control. The predicted design values for each site from this modeling scenario are shown in Table 4.

Table 4. 2019 Modeled 24-hour PM2.5 Design Values.

Monitoring Site	Design Value ($\mu g/m^3$)
Bakersfield - California	35.7
Bakersfield - Planz	32.9
Corcoran - Patterson	32.1
Visalia - N. Church	29.4
Fresno - Hamilton	28.6
Fresno-1st	30.5
Clovis	28.6
Merced	22.6
Modesto	24.7
Stockton	21.4

b. Benefits of emission reductions from on-going programs

The implementation of new reductions from California's on-going emission control programs will provide the major portion of the emission reductions needed to attain the 24-hour PM2.5 standard throughout the San Joaquin Valley in 2019. The PM2.5 design value at the Bakersfield-California site must decrease by approximately 45 percent to demonstrate attainment. Between 2007, the base year used in the photochemical modeling attainment demonstration, and 2019, implementation of these control programs will reduce NOx emissions by 55 percent. Previous sections of this WOE document have demonstrated that prior reductions in NOx have resulted in commensurate reductions in ambient concentrations of nitrate. This is consistent with modeled predictions that demonstrate a nearly 45 percent reduction in ammonium nitrate concentrations. In addition, while directly emitted PM2.5 emissions in aggregate are decreasing by nearly 30 percent, a major focus of the attainment control strategy is further curtailment of residential wood burning. Ambient measurements and modeling studies have shown the large contribution that residential wood burning has on PM2.5 exceedance days. In addition, prior District analysis has demonstrated the significant benefits of past implementation of wood burning curtailment. Therefore, the substantial continuing reductions that will result from implementation of the ongoing control program, coupled with an enhanced residential burning curtailment program, are consistent with the benefits predicted in the modeled attainment demonstration.

As a result of the overall control program, coupled with the enhanced wood burning curtailment measure, ammonium nitrate concentrations are predicted to decrease by nearly 45 percent, organic carbon concentrations by approximately 65 percent, and elemental carbon concentrations by nearly 80 percent. A comparison of the concentrations of the main chemical constituents in 2007 to that predicted in 2019 at three sites (Modesto, Fresno-1st, and Bakersfield-California) illustrates the significant reductions in these components (Table 5).

Table 5. Comparison of the concentration of chemical constituents for 2007 and 2019 design values at selected sites.

Component (ug/m^3)	Bakersfield – Calif.		Fresno-1st		Modesto	
	2007	2019	2007	2019	2007	2019
Ammonium Nitrate	41.1	22.6	32.1	17.0	28.5	15.6
Ammonium Sulfate	4.7	4.4	3.2	2.5	3.1	2.7
Organic Carbon	15.2	6.6	22.9	8.9	19.7	4.6
Elemental Carbon	2.2	0.5	2.8	0.6	1.6	0.3

c. Evaluation of precursor sensitivity

Effectiveness of Valley wide emission reductions

In order to determine where to focus the remaining emission reductions needed to bring Bakersfield-California into attainment, as well as identify the attainment plan precursors, ARB staff conducted additional modeling sensitivity runs to assess the relative efficacy of further reductions of different PM2.5 precursors. U.S. EPA's PM2.5 implementation rule specifies that a precursor is considered "significant" for control strategy development purposes when a significant reduction in the emissions of that precursor pollutant leads to a significant decrease in PM2.5 concentrations. Such pollutants are known as "PM2.5 attainment plan precursors" (72 FR 20586). The U.S. EPA's implementation rule also establishes a presumption that PM2.5, NOx, and SOx are attainment plan precursors, while VOCs and ammonia are not. In the past for the annual PM2.5 plan, PM2.5, NOx, and SOx were identified and approved as the only attainment plan precursors by U.S. EPA. Results of the annual PM2.5 modeling showed that of these three pollutants, reductions in directly emitted PM2.5 was the most effective. However, because emissions change over time, it is important to continue to assess the attainment plan precursors each time a plan is developed.

Additional photochemical modeling analyses were therefore conducted to understand the relative effectiveness of emission reductions for primary PM2.5 and precursors throughout the Valley in 2019. In these analyses, the model was run with varying combinations of valley wide precursor emission reductions from anthropogenic sources:

- NOx vs. PM2.5
- NOx vs. Ammonia
- NOx vs. VOCs
- NOx vs. SOx

Table 6 compares the modeled effect on the 2019 design value obtained at each monitoring site from a 25 percent reduction in the specified precursor. Consistently, direct PM2.5 productions have the most benefit, followed by NOx reductions. Reductions in ammonia and SOx provide much smaller benefits, while reductions in VOCs result in very small disbenefits at many sites. Table 7 presents this same information, but normalized to reflect the reduction in design value per ton of each precursor reduced. On this basis, valley wide reductions in PM2.5 are approximately four times as effective as NOx, and approximately five times as effective as SOx. In contrast, reductions in ammonia are approximately nine times less effective than NOx, and as noted above, reductions in VOCs result in either no impact of very small disbenefits.

Table 6. Modeled reduction in 2019 PM2.5 design value resulting from 25 percent reduction in valley wide precursor emissions.

Monitoring Site	PM2.5 Reduction (µg/m^3)				
	Primary PM2.5	NOx	Ammonia	SOx	VOC
Bakersfield -California	4.44	3.75	0.55	0.18	- 0.10
Bakersfield-Planz	3.80	3.64	0.58	0.19	-0.06
Visalia	3.51	3.10	0.37	0.09	-0.06
Corcoran	3.34	3.99	0.70	0.08	-0.20
Fresno-1st	4.12	2.62	0.51	0.09	0.03
Fresno-Hamilton	3.73	2.57	0.50	0.11	0.05
Clovis	3.29	3.17	0.55	0.09	0.00
Modesto	2.49	1.76	0.43	0.17	0.03
Merced	2.54	2.31	0.34	0.11	-0.01
Stockton	1.87	1.30	0.48	0.20	0.03

Table 7. Modeled PM2.5 air quality benefit per ton of valley wide precursor emission reductions.

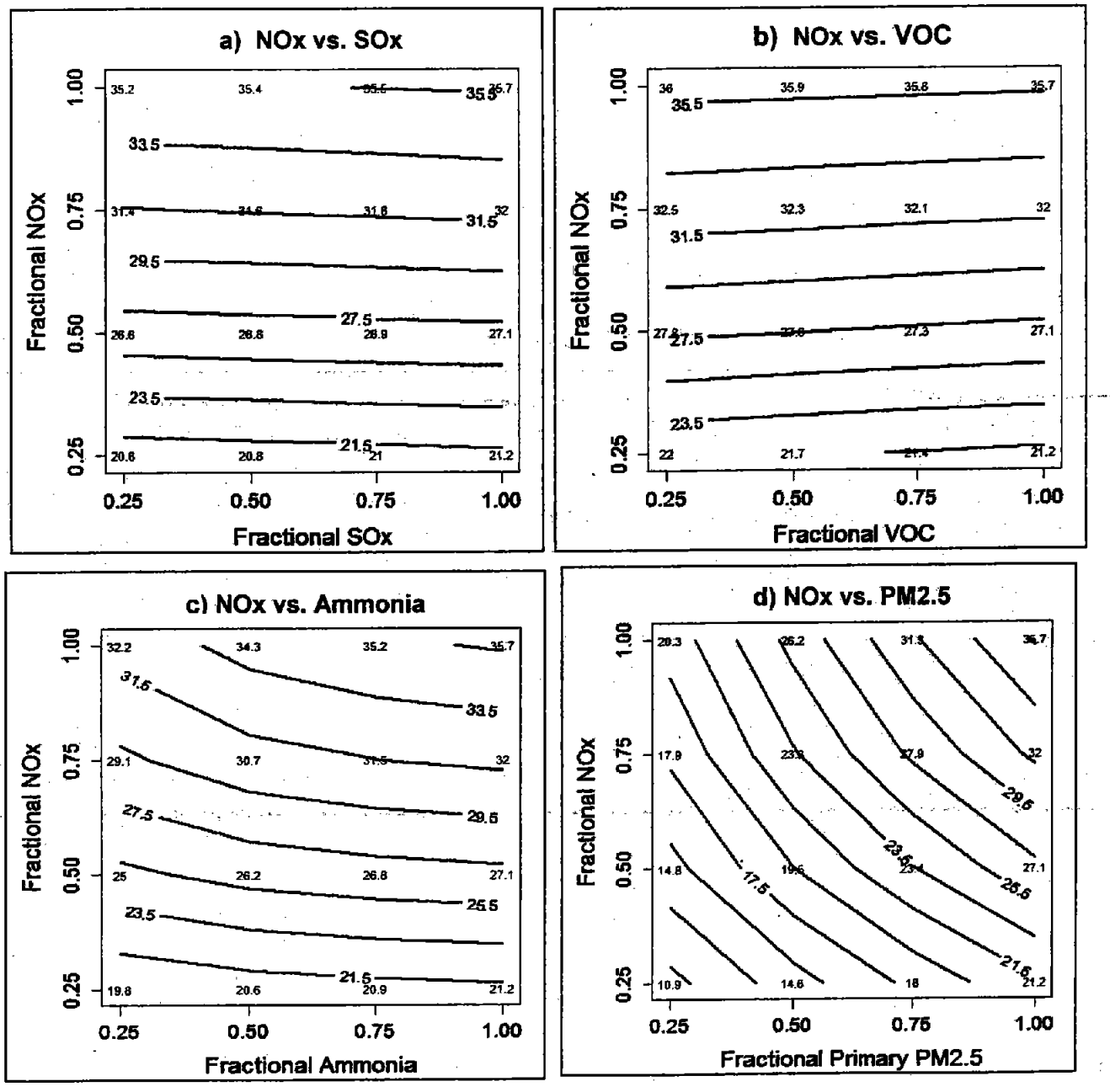
Monitoring Site	PM2.5 Benefit (µg/m^3 per ton reduction)				
	Primary PM2.5	NOx	Ammonia	SOx	VOC
Bakersfield-California	0.34	0.08	0.008	0.08	-0.001
Bakersfield-Planz	0.29	0.08	0.009	0.08	-0.001
Visalia	0.27	0.07	0.005	0.04	-0.001
Corcoran	0.25	0.09	0.010	0.04	-0.003
Fresno-1st	0.31	0.06	0.008	0.04	0.000
Fresno-Hamilton	0.28	0.06	0.007	0.05	0.001
Clovis	0.25	0.07	0.008	0.04	0.000
Modesto	0.19	0.04	0.006	0.08	0.000
Merced	0.19	0.05	0.005	0.05	0.000
Stockton	0.14	0.03	0.007	0.09	0.000

The results of these modeling sensitivity runs were also plotted on isopleth diagrams which reflect the change in the 2019 design value at each level of emission reduction. Isopleth diagrams for the Bakersfield-California site are shown in Figures 54 (a) through (d) to illustrate the overall nature of the modeled response:

- While reducing SOx results in less sulfuric acid and subsequent ammonium sulfate formation, SOx reductions have only a small effect on the predicted design value since ammonium sulfate is a small component of measured PM2.5.
- Reducing VOCs leads to very small increases in the design value because these reductions have the effect of making more NOx available for nitric acid, and subsequent ammonium nitrate formation.
- Because ammonia is much more abundant than NOx, the atmosphere is more responsive to reductions in NOx as compared to ammonia. Reductions in NOx in turn have significant benefits as ammonium nitrate is a large component of measured PM2.5.
- Reductions in directly emitted PM2.5 result in significant benefits due to the reduction in organic carbon which is a large component of measured PM2.5.

These modeling results, along with the findings from past modeling and monitoring studies highlight that reductions in directly emitted PM2.5 and NOx provide the greatest benefit in further reducing PM2.5 concentrations and making progress towards attainment. Given that significant reductions in VOCs and ammonia do not provide significant air quality benefits, per U.S. EPA guidance, the 24-hour PM2.5 attainment plan precursors are directly emitted PM2.5, NOx, and SOx.

Figure 54. Bakersfield–California Isopleth Diagrams.



Effectiveness of localized emission reductions

The valley wide precursor sensitivity modeling demonstrates that on a relative basis the greatest benefits are achieved from reductions in sources of directly emitted PM2.5, followed by NOx. Due to the stagnant conditions that occur during wintertime episodes, and the local nature of directly emitted PM2.5 carbon sources in particular, Kern County specific model sensitivity runs were also conducted to evaluate the benefits of emission reductions focused on the nonattainment sub-area. The Kern County sensitivity runs demonstrated that:

- One ton per day of directly emitted PM2.5 reductions provides a 1 $\mu g/m^3$ improvement in the Bakersfield-California design value;
- One ton per day of NOx reductions provides for a 0.12 $\mu g/m^3$ improvement in the Bakersfield-California design value;
- One ton per day of SOx reductions provides for a 0.21 $\mu g/m^3$ improvement in the Bakersfield-California design value;
- One ton per day of ammonia reductions provides for a 0.02 $\mu g/m^3$ improvement in the Bakersfield-California design value; and
- One ton per day of VOC reductions has no effect on the Bakersfield-California design value.

An examination of sources surrounding the Bakersfield-California monitoring site was then conducted in order to identify potential PM2.5 and NOx sources for further control. The forecasted 2019 PM2.5 and NOx gridded emission inventories were evaluated, focusing on the winter months of November through February when the majority of PM2.5 exceedances occur. The top five emission sources of PM2.5 and NOx in the 9 grid cells (3x3 grid cells, each measuring 4 km x4 km) centered on the Bakersfield-California monitoring site are shown in Figures 55 and 56. The main combustion sources of PM2.5 are commercial cooking, residential fuel combustion, and on-road vehicles. The main NOx source is on-road vehicles, with smaller contributions from off-road equipment, residential fuel combustion, and trains. This analysis suggests that for PM2.5, a focused effort to further reduce residential wood burning and limit emissions from commercial cooking operations would have significant benefits in reducing PM2.5 concentrations in the Bakersfield area. Key NOx sources include on- and off-road mobile sources which are already the focus of ongoing control programs.

Figure 55. 2019 top five wintertime PM2.5 emission sources within the Bakersfield-California 9-grid cell area (3x3 grid cells, each measuring 4 km x 4 km with the Bakersfield-California monitor located in the center cell). Wintertime emissions expressed as an average of January, February, November and December emissions.

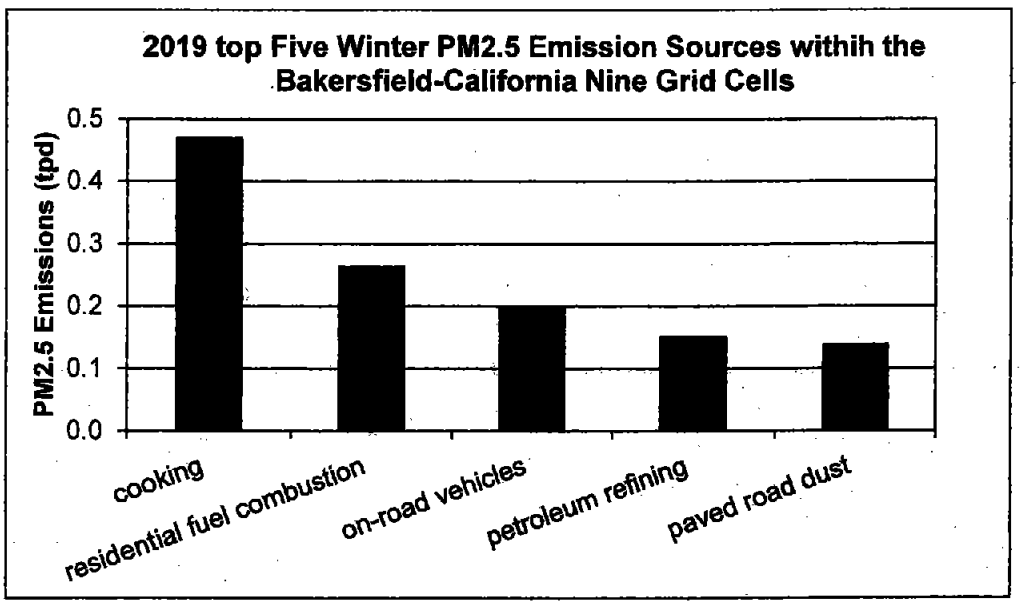
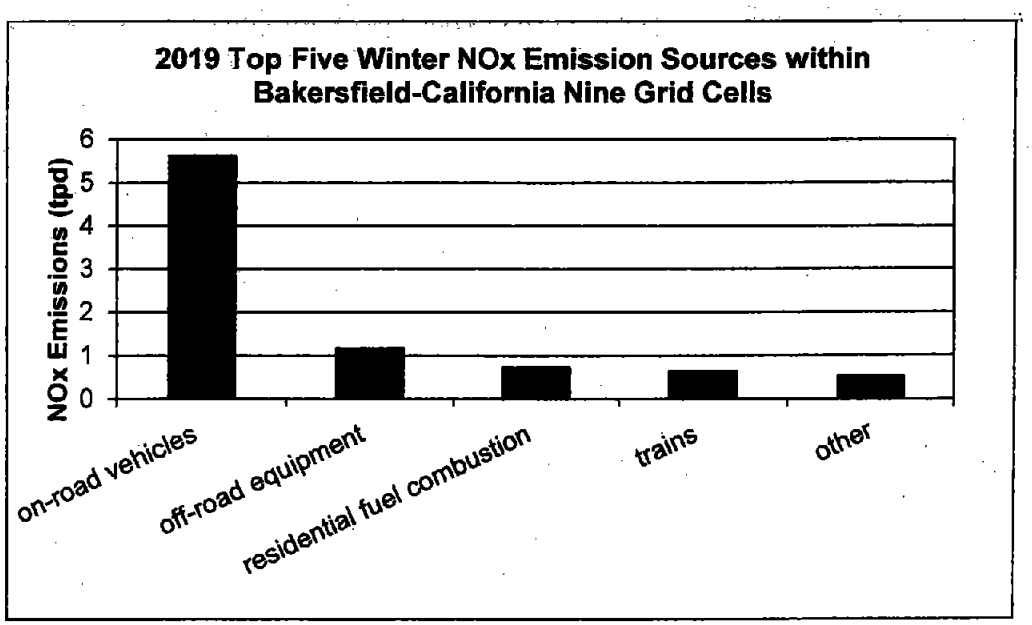


Figure 56. 2019 top five wintertime NOx emission sources within the Bakersfield-California 9-grid cell area (3x3 grid cells, each measuring 4 km x 4 km with the Bakersfield-California monitor located in the center cell). Wintertime emissions expressed as an average of January, February, November and December emissions.



d. Demonstrating attainment at Bakersfield-California

While adoption of a more stringent wood burning curtailment program brings the Bakersfield-California site very near attainment, further reductions are needed to meet the attainment target of 35.4 $\mu g/m^3$. Based upon the precursor sensitivity analysis and evaluation of the localized inventory discussed in the previous section, further control of PM2.5 emissions from commercial cooking operations was identified as the most effective approach to provide the emission reductions needed to reach attainment. The final attainment demonstration for the Bakersfield-California design site is provided in Table 8 below:

Table 8. Attainment Demonstration for the Bakersfield-California Design Value Site.

2007 Design Value ($\mu g/m^3$)	2019 Design Value with Wood Burning Program Enhancement ($\mu g/m^3$)	2019 Final Design Value ($\mu g/m^3$)
65.6	35.7	≤35.4

Note: The benchmark for attainment is a design value that is equal to or less than 35.4 $\mu g/m^3$.

As noted above, the design value in the center column of the table reflects the implementation of ongoing control programs, as well as implementation of an enhanced residential wood burning curtailment program. The final design value reflects the combined impact of further reductions in commercial cooking, as well as a small increase in motor vehicle emissions due to updated vehicle activity data from the San Joaquin Valley Metropolitan Planning Organizations (MPOs). Based on a modeling sensitivity run, implementation of further controls on commercial cooking is expected to result in a 0.6 $\mu g/m^3$ reduction in the baseline design value. The revised MPO activity data represents approximately one percent of Valley wide NOx emissions. Based on modeling sensitivity runs, this is estimated to result in a design value increase of 0.2 $\mu g/m^3$. In aggregate, the modeling demonstrates a design value that meets U.S. EPA's attainment target of 35.4 $\mu g/m^3$.

11. SUMMARY

Consideration of the entirety of information presented in the weight of evidence provides a consistent assessment that supports the modeled attainment date of 2019. The substantial continuing reductions that will result from implementation of the ongoing control program, coupled with new measures addressing residential wood burning and cooking, are consistent with the results predicted in the modeled attainment demonstration. This weight of evidence assessment is based upon the following factors:

- Over the last decade significant progress has occurred in reducing 24-hour PM2.5 concentrations. The 24-hour design value has decreased by over 30 $\mu g/m^3$, while the number of exceedance days has declined by nearly 50 percent. Meteorologically adjusted trends for the Bakersfield area show an even greater reduction in exceedance days, with a decline of over 60 percent.

- Evaluation of the air quality model response to emission reductions, as well as model sensitivity runs demonstrates that reductions in directly emitted PM2.5 have the greatest impact per ton of emissions, followed by NOx. For example, in Kern County, PM2.5 emission reductions are approximately eight times more effective than NOx.

- Both receptor and photochemical grid based modeling have identified residential wood burning as a significant contributor to wintertime PM2.5 concentrations. The reductions in the organic carbon component of PM2.5 that have occurred can be linked to implementation of the District's residential wood burning curtailment program.

- Evaluation of emissions inventory data, monitoring studies, and photochemical modeling indicate that controlling NOx emissions is the most effective strategy to reduce ammonium nitrate concentrations.

- The decrease in ammonium nitrate concentrations observed at Valley monitoring sites tracks concurrent reductions in NOx emissions as well as trends in gaseous NOx concentrations.

- Substantial NOx and PM2.5 emission reductions will occur between 2007 and 2019 due to the implementation of on-going measures and additional new measures. As a result of these programs, NOx emissions will decrease by over 50 percent, and PM2.5 emissions by nearly 30 percent.

- The modeled attainment demonstration predicts that all sites in the Valley will attain by 2019. This modeling assessment is consistent with the benefits seen from previous reductions in the sources and pollutants being addressed as part of the attainment strategy.

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San Joaquin Valley PM2.5 Weight of Evidence Analysis

Appendix 1

California Regional PM10/PM2.5 Air Quality Study

Publications

CALIFORNIA REGIONAL PM10/PM2.5 AIR QUALITY STUDY PUBLICATIONS

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San Joaquin Valley PM2.5 Weight of Evidence Analysis

Appendix 2

PM2.5 Source Apportionment for the San Joaquin Valley Air Basin Using the Chemical Mass Balance Receptor Model

PM2.5 Source Apportionment for the San Joaquin Valley Air Basin Using the Chemical Mass Balance Receptor Model

1) Data Collection and Screening

PM2.5 chemical composition data collected at the Bakersfield-California and Fresno-1st Street sites were used for the Chemical Mass Balance (CMB) analysis. The two sites are part of the Chemical Speciation Network (CSN) and use the SASS (Spiral Aerosol Speciation Sampler, Met One, Grants Pass, OR.) for data collection. The Bakersfield-California and Fresno-1st samplers are configured with several channels, each channel containing one 47mmfilter with a 6.7 L/min flow rate. One channel contains a Whatman Teflon®-membrane filter for mass by gravimetry and elements by XRF. Another channel includes a magnesium oxide-coated aluminum (Al) honeycomb after the cyclone followed by a Nylasorb nylon-membrane filter for water-soluble anions i.e., NO_3^- and $SO_4^=$) and cations (i.e., ammonium [NH_4^+] and water-soluble sodium [Na^+] and potassium [K^+]) by IC. In the past, another channel containing a Whatman QMA quartz-fiber filter was used for OC and EC analysis by the STN thermal/optical transmittance (TOT) protocol. In recent years changes were made to the carbon sampling and analysis method. The collection method changed from the MetOne SASS to the URG3000N sampler, which is very similar to the IMPROVE module C sampler. The analytical method was changed from the NIOSH-like thermal optical transmittance (TOT) method to IMPROVE_A thermal optical reflectance (TOR). A new backup quartz filter is also collected using the URG3000N to help assess artifacts. The backup filter is placed behind the routine quartz sampler filter. This change took place on May 3, 2007 at Bakersfield and April 1, 2009 at Fresno.

Due to the change in carbon collection and analysis method, several data sets were generated for CMB modeling to allow separate analysis of old and new carbon data. Throughout this document we will refer to 'old carbon' data and 'new carbon' data. Old carbon data were collected using the SASS sampler and analyzed using the NIOSH-like thermal optical transmittance (TOT) method. New carbon data were collected using the modified IMPROVE version II Module C sampler, the URG3000N, and analyzed using the IMPROVE-A thermal optical reflectance (TOR) method. Both old and new carbon data were corrected for sampling artifacts prior to running CMB.

2) Data Preparation

Organic carbon (OC) data were corrected for sampling artifacts prior to running CMB. Old carbon data, collected using the SASS sampler and analyzed using the NIOSH-like thermal optical transmittance (TOT) method, were corrected by subtracting a California network-wide average organic carbon blank of 1 ug/m3 from the measured OC concentration. New carbon data were adjusted by subtracting network-wide monthly average concentrations measured on a backup filter from daily measurements of organic carbon [88370]. The monthly average backup concentrations are shown in Table 1.

Table 1. Organic Carbon Monthly Average Concentrations on Backup Filter

Month	1	2	3	4	5	6	7	8	9	10	11	12
Avg Blank Value (ug/m3)	0.66	0.54	0.48	0.43	0.43	0.48	0.54	0.49	0.53	0.50	0.60	0.57

3) Source Profiles

The major source types which have been found to contribute to primary PM2.5 in the San Joaquin Valley are motor vehicle exhaust, vegetative burning, geological material, marine-derived aerosols, residual or crude oil combustion, and tire and brake wear. Most of the source profiles applicable to the San Joaquin Valley were determined during the California Regional PM10/PM2.5 Air Quality Study (CRPAQS) or earlier. Therefore, the profiles used in this analysis, listed in Table 4, are the same profiles that were used in the previous analysis for the 2008 San Joaquin Valley PM2.5 Plan.

Motor vehicle profiles for diesel (DIES) and gasoline (GAS) (Fujita et al., 2005) were used in modeling PM2.5 concentrations. Since more specific organic markers for gasoline and diesel were not available at the receptor site, the two profiles were collinear and had to be combined into a single profile representing motor vehicle emissions. Diesel and gasoline vehicle emissions source profiles were combined in proportions equivalent to their county-level contributions to the PM2.5 emissions to produce a single emission-weighted overall source profile. Table 2 lists PM2.5 emissions (EMFAC 2011, July 2011) that were used as a basis for creating county-based composite profiles for Bakersfield and Fresno.

Table 2. Average 2004-2010 PM2.5 Exhaust Emissions (tons per day)

County		Gasoline Vehicles	Diesel Vehicles
Kern County	2004-2006 (K6GASDIE)	0.12	2.54
	2008-2010 (K9GASDIE)	0.09	1.88
Fresno County	2004-2006 (F6GASDIE)	0.12	1.33
	2008-2010 (F9GASDIE)	0.08	0.97

Table 4. Source Profiles (as Percent of the PM2.5 Mass) Used in the CMB Modeling

PNO	38			35			13			18			41			54			32		
SOURCE	AMNIT			AMSUL			WBOakEuc			AgBWheat			OC			MARINE75			TireBrke		
N3IC	77.50	±	7.75	0.00	±	0.00	0.57	±	0.07	0.16	±	0.02	0.00	±	0.00	22.88	±	2.60	0.19	±	1.14
S4IC	0.00	±	0.00	72.70	±	7.27	1.30	±	0.83	0.44	±	0.04	0.00	±	0.00	7.20	±	0.82	0.78	±	2.10
N4CC	22.55	±	2.26	27.30	±	2.73	0.58	±	0.47	0.59	±	0.04	0.00	±	0.00	0.00	±	0.10	0.16	±	0.73
NAAC	0.00	±	0.00	0.00	±	0.00	0.38	±	0.15	0.54	±	0.04	0.00	±	0.00	28.80	±	3.27	0.10	±	0.42
KPAC	0.00	±	0.00	0.00	±	0.00	2.89	±	0.45	6.79	±	0.50	0.00	±	0.00	1.07	±	0.12	0.05	±	0.17
OCTC	0.00	±	0.00	0.00	±	0.00	59.58	±	4.75	57.03	±	4.54	100.00	±	10.00	0.00	±	0.10	18.81	±	24.53
ECTC	0.00	±	0.00	0.00	±	0.00	5.20	±	1.12	10.31	±	0.85	0.00	±	0.00	0.00	±	0.10	4.55	±	5.99
ALXC	0.00	±	0.00	0.00	±	0.00	0.07	±	0.05	0.07	±	0.01	0.00	±	0.00	0.00	±	0.00	0.32	±	1.89
SIXC	0.00	±	0.00	0.00	±	0.00	0.22	±	0.10	0.13	±	0.01	0.00	±	0.00	0.01	±	0.00	0.69	±	1.81
PHXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.01	0.00	±	0.01	0.00	±	0.00	0.00	±	0.00	0.00	±	0.05
CLXC	0.00	±	0.00	0.00	±	0.00	1.72	±	2.02	6.16	±	0.44	0.00	±	0.00	38.74	±	4.40	0.04	±	0.08
KPXC	0.00	±	0.00	0.00	±	0.00	2.86	±	0.93	5.50	±	0.39	0.00	±	0.00	1.07	±	0.12	0.10	±	0.36
CAXC	0.00	±	0.00	0.00	±	0.00	0.15	±	0.10	0.10	±	0.03	0.00	±	0.00	1.10	±	0.12	0.28	±	1.04
TIXC	0.00	±	0.00	0.00	±	0.00	0.01	±	0.02	0.01	±	0.01	0.00	±	0.00	0.00	±	0.00	0.03	±	0.38
MNXC	0.00	±	0.00	0.00	±	0.00	0.01	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.48	±	0.29
FEXC	0.00	±	0.00	0.00	±	0.00	0.09	±	0.06	0.07	±	0.00	0.00	±	0.00	0.00	±	0.00	58.11	±	31.26
CUXC	0.00	±	0.00	0.00	±	0.00	0.01	±	0.00	1.02	±	0.07	0.00	±	0.00	0.00	±	0.00	0.16	±	0.69
ZNXC	0.00	±	0.00	0.00	±	0.00	0.04	±	0.02	0.01	±	0.00	0.00	±	0.00	0.00	±	0.00	0.35	±	2.37
BRXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.03	±	0.00	0.00	±	0.00	0.18	±	0.02	0.00	±	0.01
RBXC	0.00	±	0.00	0.00	±	0.00	0.01	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.01	±	0.01
SRXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.02	±	0.00	0.23	±	0.66
PBXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.06	±	0.03
VAXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00
NIXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00

Table 4, continued.

PNO	79			80			83			84			66			67			85			86		
SOURCE	F6GASDIE			K6GASDIE			F9GASDIE			K9GASDIE			FDFREANN			FDKERANN			CHCRUC			SFCRUC		
N3IC	0.22	±	1.24	0.16	±	1.24	0.21	±	1.24	0.16	±	1.24	0.02	±	0.28	0.05	±	0.16	0.00	±	0.05	0.00	±	0.01
S4IC	2.77	±	7.25	2.60	±	7.25	2.74	±	7.25	2.61	±	7.25	0.56	±	0.72	0.47	±	0.29	14.72	±	6.24	20.32	±	4.24
N4CC	0.98	±	3.24	0.89	±	3.24	0.96	±	3.24	0.89	±	3.24	0.04	±	0.18	0.13	±	0.20	0.76	±	0.08	0.01	±	0.01
NAAC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.17	±	0.07	0.26	±	0.24	0.25	±	0.06	0.76	±	0.40
KPAC	0.10	±	0.08	0.10	±	0.08	0.10	±	0.08	0.10	±	0.08	0.27	±	0.12	0.80	±	1.25	0.01	±	0.01	0.06	±	0.01
OCTC	43.05	±	27.33	42.40	±	27.33	42.93	±	27.33	42.41	±	27.33	14.34	±	8.66	10.29	±	5.32	1.99	±	1.33	0.09	±	0.12
ECTC	50.59	±	17.73	51.50	±	17.73	50.75	±	17.73	51.49	±	17.73	1.92	±	1.29	0.69	±	0.72	3.01	±	1.12	0.00	±	0.07
ALXC	0.11	±	0.14	0.11	±	0.14	0.11	±	0.14	0.11	±	0.14	9.97	±	2.95	7.67	±	2.53	0.00	±	0.05	0.00	±	0.01
SIXC	1.14	±	4.12	0.99	±	4.12	1.11	±	4.12	0.99	±	4.12	26.77	±	9.63	22.05	±	5.29	0.00	±	0.08	0.01	±	0.02
PHXC	0.14	±	0.51	0.13	±	0.51	0.14	±	0.51	0.13	±	0.51	0.33	±	0.91	0.33	±	0.91	0.00	±	0.57	0.00	±	0.17
CLXC	0.07	±	0.30	0.06	±	0.30	0.07	±	0.30	0.06	±	0.30	0.11	±	0.08	0.46	±	0.48	0.05	±	0.01	0.02	±	0.00
KPXC	0.07	±	0.08	0.07	±	0.08	0.07	±	0.08	0.07	±	0.08	2.30	±	0.92	3.26	±	1.59	0.00	±	0.00	0.04	±	0.01
CAXC	0.50	±	1.42	0.49	±	1.42	0.50	±	1.42	0.49	±	1.42	3.01	±	0.67	5.54	±	3.03	0.00	±	0.03	0.06	±	0.00
TIXC	0.01	±	0.08	0.01	±	0.08	0.01	±	0.08	0.01	±	0.08	0.48	±	0.05	0.44	±	0.24	0.01	±	0.00	0.01	±	0.00
MNXC	0.00	±	0.01	0.00	±	0.01	0.00	±	0.01	0.00	±	0.01	0.11	±	0.02	0.11	±	0.08	0.00	±	0.00	0.01	±	0.00
FEXC	0.44	±	0.44	0.44	±	0.44	0.44	±	0.44	0.44	±	0.44	5.30	±	0.58	5.09	±	2.84	0.71	±	0.09	0.21	±	0.02
CUXC	0.01	±	0.05	0.01	±	0.05	0.01	±	0.05	0.01	±	0.05	0.02	±	0.00	0.01	±	0.01	0.01	±	0.01	0.00	±	0.00
ZNXC	0.27	±	0.41	0.26	±	0.41	0.27	±	0.41	0.26	±	0.41	0.14	±	0.08	0.07	±	0.05	0.01	±	0.00	0.26	±	0.03
BRXC	0.03	±	0.06	0.03	±	0.06	0.03	±	0.06	0.03	±	0.06	0.01	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00
RBXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.01	±	0.00	0.01	±	0.00	0.00	±	0.00	0.00	±	0.00
SRXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.03	±	0.01	0.03	±	0.01	0.00	±	0.00	0.00	±	0.00
PBXC	0.01	±	0.03	0.01	±	0.03	0.01	±	0.03	0.01	±	0.03	0.18	±	0.13	0.09	±	0.32	0.00	±	0.00	0.00	±	0.00
VAXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.42	±	0.04	0.82	±	0.06
NIXC	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	0.00	±	0.00	2.48	±	0.25	0.79	±	0.09

Biomass burning was represented using an agricultural burning profile (AgBWheat) from June through October and a composite residential wood burning profile (WBOakEuc) the rest of the year. The agricultural burning profile (AgBWheat) was based on burning of wheat stubble (Fitz et al., 2000). The residential wood burning profile (WBOakEuc) was used to represent residential wood combustion during colder months and was calculated as an average of oak and eucalyptus.

Geological material in the San Joaquin Valley comes from a variety of sources, including roads (paved and unpaved), agricultural operations such as land preparation and harvesting, construction, and soil erosion. The Central California Fugitive Dust Characterization Study acquired 47 samples from 37 areas (Chow et al., 2003). These included: 1) paved road dust from urban and rural areas, 2) unpaved road dust, 3) agricultural soil from five crop fields (almond, cotton, grape, safflower, and tomato), 4) dairy and feedlot soil, 5) salt buildup deposits from irrigation canal drainages, and 6) building construction/earthmoving soil.

In addition to these latest profiles, some older soil profiles collected in the Valley in the late 80's were also used to create composite profiles that best represent fugitive dust sources at each site in the San Joaquin Valley. Information on the relative fractions of paved and unpaved road dust, as well as agricultural dust, along with information on the seasonality of agricultural operations and predominant crop types were used to determine which source profiles to include in each composite. Site specific composite profiles were then used in the CMB analysis. Table 3 lists geological profiles included in the composites created for modeling PM2.5 concentrations. Appendix A includes additional information about geological profiles.

Table 3. Geological Composite Source Profiles

Composite Profile ID	Sample	% Weight	Applicable Area
FDKERANN	SOIL31	25	Bakersfield
	FDPVR1	25	
	FDCTF	25	
	SOIL13	25	
FDFREANN	SOIL03	70	Fresno
	FDALM	10	
	FDGRA1	10	
	FDTOM1	10	

Sea salt was represented using a reacted sea salt profile, MARINE75, in which 25 percent of the Cl was replaced by nitrate on a molar basis (Chow et al., 1996a).

Tire and brake samples were collected as part of the 'Development of a Gas and Particulate Matter Organic Speciation Profile Database' conducted by CE-CERT (Fitz et al., 2000). Tire and brake samples were composited into a single weighted average profile. The two profiles were weighted based on EMFAC 2011 emissions, which estimate a 9 to 1 ratio of brake emissions to tire emissions.

Secondary nitrate and sulfate were represented by pure ammonium nitrate (NH_4NO_3) and ammonium sulfate $(NH_4)_2SO_4$. A "pure" OC profile was used to represent other unidentified primary sources, contributions from secondary OC, and the possible positive OC sampling artifacts.

Crude-oil combustion profiles were included to help explain ambient concentrations of vanadium (V) and nickel (Ni). The profile representing the Santa Fe crude-oil broiler at the Westside Kern County oil field helped to explain vanadium and nickel concentrations at Bakersfield, while the crude-oil profile representing the Chevron Racetrack boiler at the Kern River oil field provided a better fit at Fresno.

4) Fitting Species

Table 5 lists fitting species used in CMB runs.

Table 5. CMB Fitting Species

Nitrate	Silicon	Zinc
Sulfate	Chlorine	Bromine
Ammonium	Potassium	Rubidium
Soluble Sodium	Calcium	Strontium
Soluble Potassium	Titanium	Lead
Organic Carbon	Manganese	Vanadium
Elemental Carbon	Iron	Nickel
Aluminum	Copper	

5) Runs

PM2.5 chemical composition data were collected on a one in three days schedule at each site. Table 6 shows the number of samples included under each scenario.

Table 6. Number of Samples included in the CMB Runs

Site	Old Carbon	New Carbon
BAC	157	267
FSF	390	200

Data for each sampling day were run individually under several scenarios. Each run included the following profiles: ammonium nitrate, ammonium sulfate, motor vehicle, fugitive dust, tire and brake wear, marine, and in the case of Bakersfield, crude oil combustion. In the case of Fresno, the crude oil combustion profile was included only when it was necessary to explain the vanadium and nickel contributions. Biomass burning and 'other OC' profiles were included as needed. First, all data were run with a biomass burning profile (AgBWheat from June through October, WBoakEuc the rest of the year) and the 'other OC'. The results were examined to determine if all source contributions were positive and performance parameters were within acceptable ranges. If using the biomass burning profile along with the 'other OC' gave unsatisfactory results, the data were run again using just one of the two profiles, as described below.

1. Run 1 included a biomass burning profile and 'other OC'.
2. Run 2 included a biomass burning profile but not the 'other OC' profile. It was geared towards days when primary sources of organic carbon (biomass burning, motor vehicle exhaust, and geological material) sufficiently accounted for the ambient organic carbon.
3. Run 3 included 'other OC' but no biomass burning profile. It was geared towards days with no biomass burning and applied only when soluble potassium concentration was reported as zero.

Data from several runs were combined into a single data file to best represent source contributions. Data were combined as follows:

1. Days with estimated positive contributions from wood burning and 'other OC' were included in the composite file.
2. Days with estimated negative contributions from 'Other OC' were treated as follows:
    a. If there should have been no burning on that day because the soluble potassium concentration was zero, run 3 which includes the 'other OC' and no wood burning was utilized.
    b. If there could have been wood burning because the soluble potassium concentration was greater than zero, run 2 which includes biomass burning was used.
3. Occasionally, the results were still unsatisfactory and profiles were adjusted individually for a particular day.

Composite files were used for subsequent analysis. Table 7 shows the number of data points from each run included in the composite file.

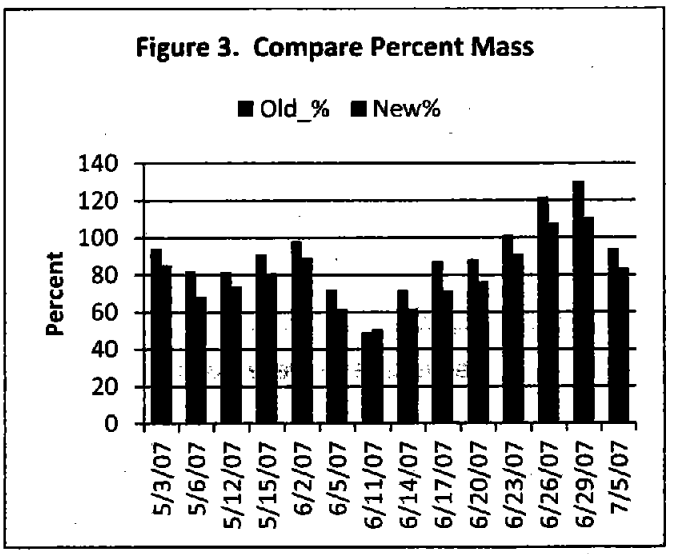
Table 7. Data included in the composite file*.

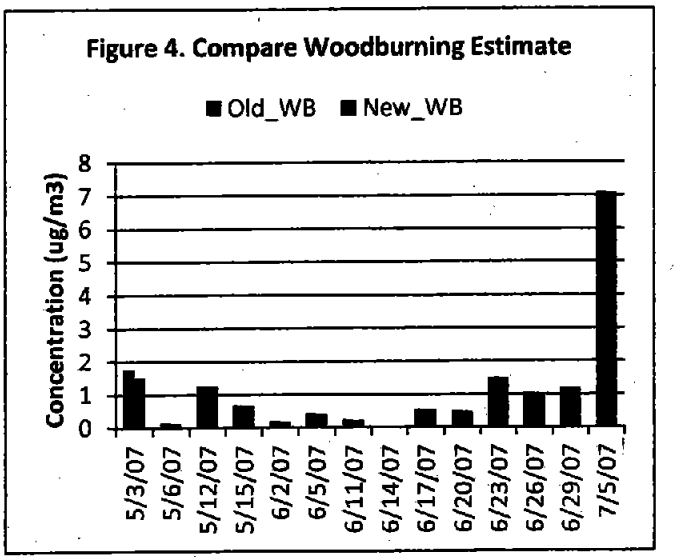
Site	Carbon Type	Run 1		Run2	Run 3	Special Run
		WBOakEuc	AgBWheat			
BAC	Old	68	41	4	16	5
BAC	New	80	113	28	12	0
FSF	Old	176	105	7	40	9
FSF	New	52	66	21	56	6

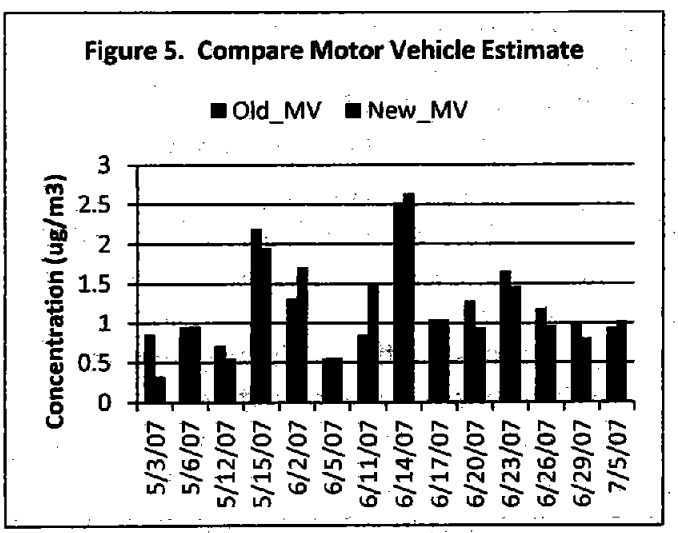
* Data with performance measures far exceeding the acceptable criteria were not included in the composite

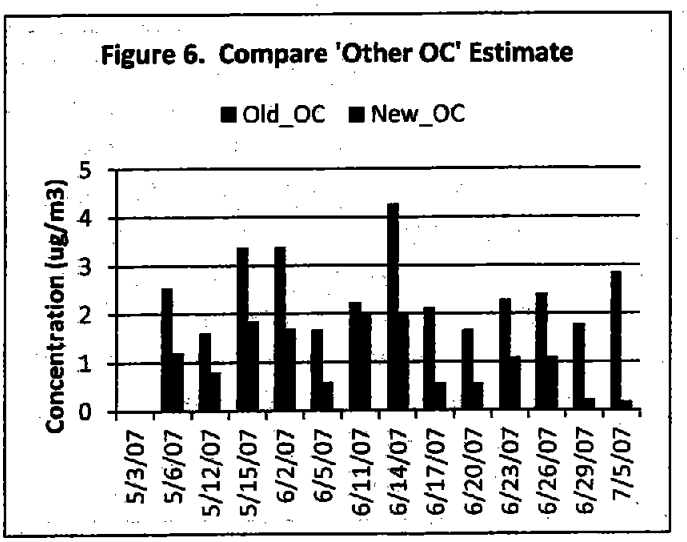
6) Comparison of CMB Estimates using Old and New Carbon

The Bakersfield-California site has 14 days with parallel old and new carbon data. Since these data were collected during the low season, the average PM2.5 concentration was only 13.6 ug/m3. The CMB model was applied to the old and new carbon data to evaluate the impact of changing carbon collection and analysis on source contribution. Using the old carbon, 10 percent more of the mass was apportioned to sources. Regardless of what carbon data were used, the model apportioned almost the same concentration to each source, except 'other OC'. Using the old carbon data, on average, 2.5 ug/m3 was assigned to the 'other OC'. Switching to the new carbon data reduced the 'other OC' estimate to 1 ug/m3. There were also several days when the motor vehicle contribution estimate differed slightly depending on which carbon data were used. Even though, on average there is no difference in measured EC between the old and new carbon method, on these particular days the measurements differed and that difference was reflected in the motor vehicle contribution. The new OC measurement is, on average, about 50 percent lower compared to the old one. This impacts how much mass gets apportioned to the 'other OC' but has no impact on motor vehicle or biomass burning contributions. Figures 3 through 6 compare percent of mass and contribution from major carbon sources using old and new carbon data.









7) Results

The CMB model was applied to 424 samples at BAC (157 with old carbon and 267 with new carbon) and 590 samples at FSF (390 with old carbon and 200 with new). Source contribution estimates were averaged to determine a typical contribution. Separately, days with concentrations greater than 30 ug/m3 were averaged to determine the typical contribution on a high PM2.5 day.

Performance measures and statistics used to evaluate the validity of CMB source apportionments include chi-square, r-square, and percent of mass accounted for by the estimated source contributions. The target values for these performance measures are chi-square less than 4, r-square greater than 0.8, and percent of mass accounted for by

the estimated source contributions between 80% and 120%. The average performance measures for both sites were within the acceptable limits as shown in Tables 8 and 10.

The results are discussed separately for each site for two reasons. First of all, each site switched to the new method at a different time. Second of all, 2009 had to be excluded from the annual average calculation at Bakersfield due to missing data.

a) Bakersfield (BAC)

The average PM2.5 concentration based on old carbon data for 2006 was 20.5 ug/m3. Based on the new carbon data, the 2008 and 2010 average PM2.5 concentration was 18.6 ug/m3. Between 2006 and 2007 (old carbon data) there were 29 high days with chemical composition data. The average PM2.5 concentration on these days was 47 ug/m3,. Between 2007 and 2010 (new carbon data), there were 36 high days with chemical composition data, with the average PM2.5 concentration of 46.7 ug/m3. Sources identified by the CMB accounted for 79 to 94 percent on annual basis and 94 to 95 percent on high days.

i) Annual

Ammonium nitrate dominated the PM2.5 mass contributing 42 to 47 percent of mass. Ammonium sulfate and biomass burning were the next most important sources contributing 10 to 12 percent of mass. Biomass burning contributed 9 to 10 to percent of the mass. The 'Other OC' contribution depended on the carbon data method; using old carbon apportioned 16 percent of mass to the 'other OC' while using new carbon reduced that contribution to 8 percent. Geological material comprised 7 to 10 percent of the mass. Each of the remaining sources (tire and brake wear, sea salt, and oil combustion) contributed no more than 1 percent of the mass.

ii) High Days

The ammonium nitrate contribution was even more significant on high days, ranging from 59 to 67 percent. Biomass burning and motor vehicles each contributed 9 to 13 percent. The 'Other OC' contribution ranged from 3 percent using new carbon to 10 percent using old carbon. Geological material contributed about 2 percent. Each of the remaining sources, tire and brake wear, sea salt, and oil combustion contributed less than 1 percent of the mass.

b) Fresno (FSF)

The average PM2.5 concentration based on old carbon data for 2006 to 2008 was 20.3 ug/m3. Based on the new carbon data, the 2010 average PM2.5 concentration was 14.2 ug/m3. Between 2006 and 2009 (old carbon data) there were 67 high days with chemical composition data. The average PM2.5 concentration on these days was 46.3 ug/m3. Between 2009 and 2010 (new carbon data), there were 22 high days with chemical composition data, with the average concentration of 40.6 ug/m3. Sources identified by the CMB accounted for 74 to 97 percent of the mass on an annual basis and 82 to 93 percent on high days.

i) Annual

Ammonium nitrate dominated the PM2.5 mass contributing 40 to 43 percent of the mass. Biomass burning contributed about 16 percent of the mass. Motor vehicles contributed slightly less, 11 to 13 percent. The ammonium sulfate contribution was 9 to 11 percent. The 'Other OC' contribution, once again, depended on carbon data; using old carbon apportioned 18 percent of mass to the 'other OC' while using new carbon reduced that contribution to 9 percent. Geological material comprised 4 to 6 percent of the mass. Each of the remaining sources contributed no more than 1 percent of the mass.

ii) High Days

The ammonium nitrate contribution was even more significant on high days when 52 to 54 percent of the mass was ammonium nitrate. Biomass burning was the second most significant source, contributing 19 to 23 percent. The motor vehicle contribution ranged from 9 to 12 percent. The 'Other OC' ranged from 4 percent using new carbon data to 13 percent using old carbon data. The remaining sources contributed less than 1 percent of the mass.

Table 8. BAC Source Contribution (ug/m3)

Source	Profile Name	Annual Average		High Days (>=30 ug/m3)	
		2006	2008 and 2010	2006-2007	2007-2010
# of samples	Obs Count	90	138	29	36
Mconc	Mconc	20.5 ± 1.1	18.6 ± 1.0	47.0 ± 2.4	46.7 ± 2.4
Cconc	Cconc	19.4 ± 1.5	15.6 ± 1.2	45.0 ± 3.1	43.9 ± 3.1
Rsquare	Rsquare	0.9	0.9	0.9	0.9
CHIsquare	CHIsquare	3.1	2.7	1.8	1.4
%MASS	%MASS	94.3	79.3	95.5	93.8
AMNIT	AMNIT	8.2 ± 0.8	7.4 ± 0.7	26.7 ± 2.5	29.6 ± 2.5
AMSUL	AMSUL	2.0 ± 0.6	1.9 ± 0.5	2.5 ± 1.2	3.4 ± 1.3
Biomass burning	Seasonal*	1.9 ± 0.4	1.5 ± 0.3	5.7 ± 1.0	4.0 ± 0.7
Motor Vehicle	K9GASDI**	2.4 ± 1.0	1.9 ± 0.6	4.2 ± 1.6	4.2 ± 1.4
OC	OC	3.2 ± 1.1	1.2 ± 0.7	4.3 ± 1.7	1.3 ± 1.2
Tire and Brake	TireBrk	0.2 ± 0.1	0.2 ± 0.1	0.3 ± 0.2	0.3 ± 0.2
Sea Salt	MARINE75	0.1 ± 0.1	0.1 ± 0.1	0.3 ± 0.1	0.2 ± 0.1
Geological	FDKERANN	1.3 ± 0.3	1.6 ± 0.3	0.7 ± 0.3	0.8 ± 0.3
Oil Refinery	SFCRUC	0.3 ± 0.1	0.1 ± 0.1	0.3 ± 0.3	0.2 ± 0.3

Table 9. BAC Source Contribution (%)

Source	Profile Name	Annual Average		High Days (>=30 ug/m3)	
		2006	2008 and 2010	2006-2007	2007-2010
# of samples	Obs Count	90	138	29	36
AMNIT	AMNIT	42.2	46.8	59.3	67.4
AMSUL	AMSUL	10.2	11.9	5.6	7.8
Biomass burning	Seasonal*	9.6	9.3	12.8	9.1
Motor Vehicle	KGASDI**	12.3	11.8	9.3	9.6
OC	OC	16.2	7.7	9.5	2.9
Tire and Brake	TireBrk	1.0	1.3	0.7	0.7
Sea Salt	MARINE75	0.4	0.5	0.6	0.5
Geological	FDKERANN	6.7	10.3	1.6	1.7
Oil Refinery	SFCRUC	1.3	0.5	0.6	0.3

* AgBWheat from June through October, WBoakEuc the rest of the year

** K6GASDIE for old carbon and K9GASDIE for new carbon

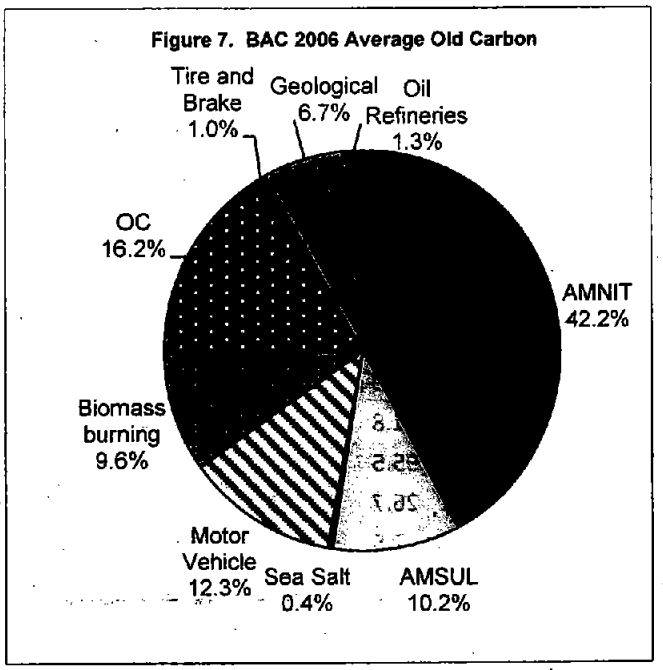


Figure 7. BAC 2006 Average Old Carbon

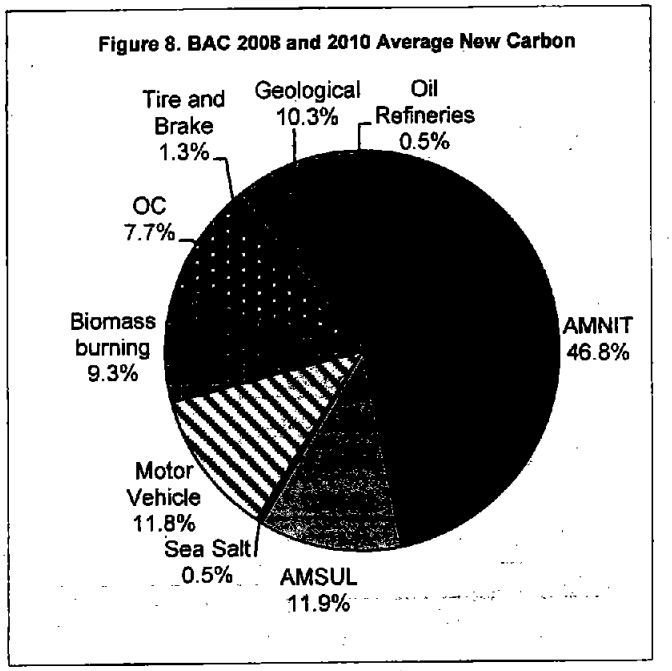


Figure 8. BAC 2008 and 2010 Average New Carbon

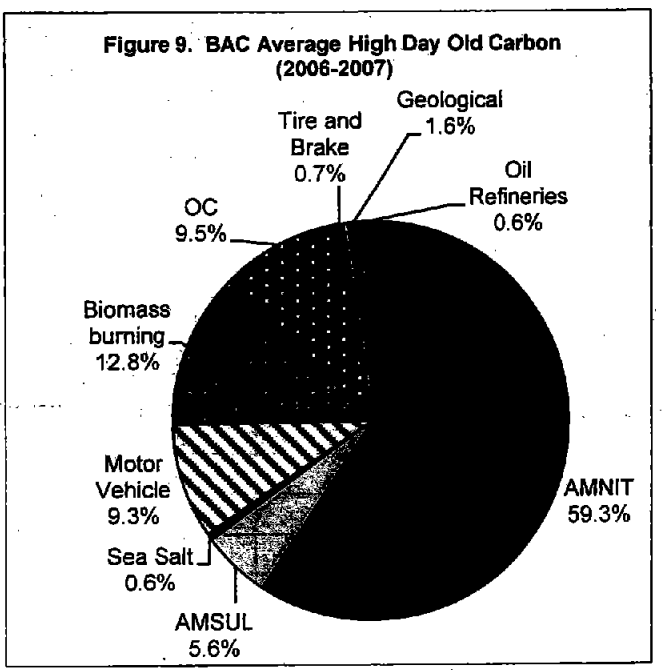


Figure 9. BAC Average High Day Old Carbon (2006-2007)

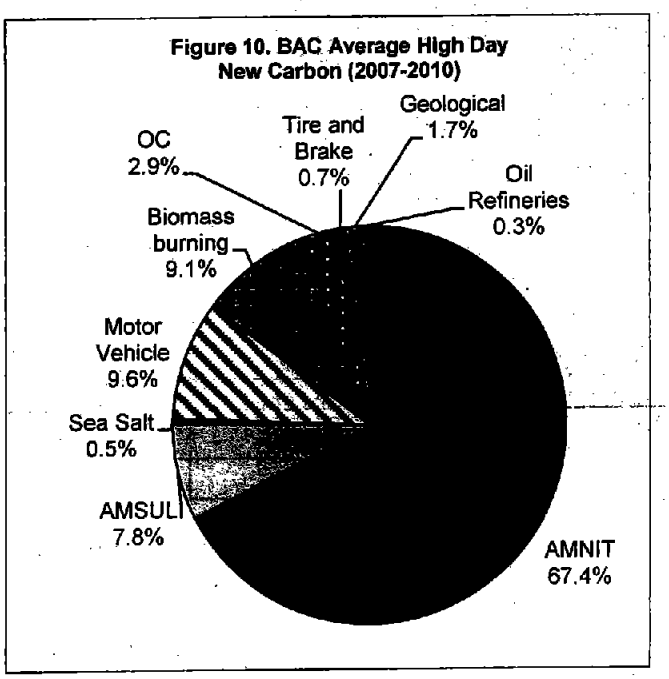


Figure 10. BAC Average High Day New Carbon (2007-2010)

Table 10. FSF Source Contribution (ug/m3)

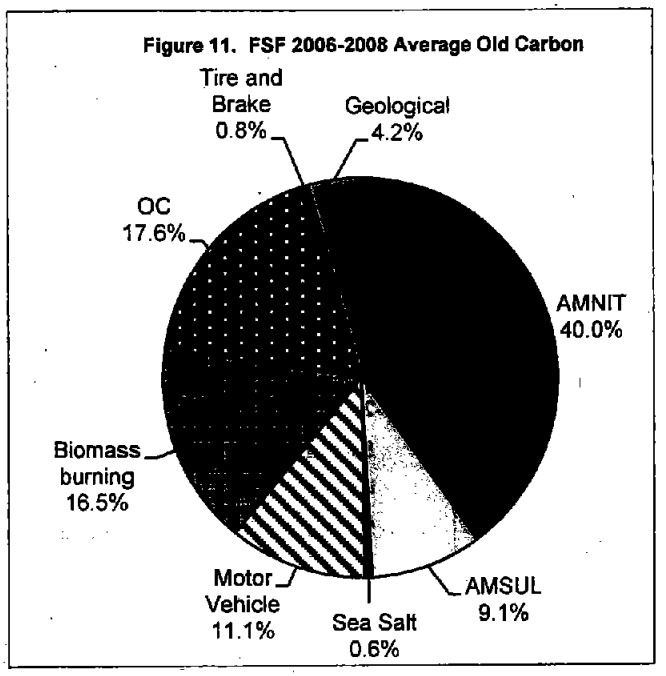
Source	Profile Name	Annual Average		High Days (>=30 ug/m3)	
		2006-2008	2010	2006-2009	2009-2010
# of samples	Obs Count	275	105	67	22
Mconc	Mconc	20.3 ± 1.1	14.2 ± 0.8	46.3 ± 2.3	40.6 ± 2.1
Cconc	Cconc	19.0 ± 1.5	10.8 ± 0.8	43.0 ± 2.9	33.1 ± 2.3
Rsquare	Rsquare	0.8	0.9	0.9	0.9
CHIsquare	CHIsquare	4.3	3.5	1.7	1.4
%MASS	%MASS	96.7	74.3	92.9	81.5
AMNIT	AMNIT	7.5 ± 0.7	4.7 ± 0.5	22.4 ± 2.1	17.8 ± 1.7
AMSUL	AMSUL	1.7 ± 0.5	1.2 ± 0.4	2.1 ± 1.1	2.0 ± 1.0
Biomass burning	Seasonal*	3.1 ± 0.5	1.7 ± 0.3	8.0 ± 1.2	7.6 ± 1.1
Motor Vehicle	FGASDI**	2.1 ± 0.9	1.4 ± 0.5	4.0 ± 1.5	3.8 ± 1.3
OC	OC	3.3 ± 1.1	1.0 ± 0.5	5.7 ± 2.0	1.5 ± 1.3
Tire and Brake	TireBrk	0.1 ± 0.1	0.1 ± 0.1	0.2 ± 0.1	0.2 ± 0.1
Sea Salt	MARINE75	0.1 ± 0.1	0.1 ± 0.1	0.2 ± 0.2	0.2 ± 0.2
Geological	FDFREANN	0.8 ± 0.2	0.6 ± 0.1	0.2 ± 0.2	0.1 ± 0.1
Oil Combustion	CHCRUC	0.01 ± 0.0		0.1 ± 0.0	0.0 ± 0.0

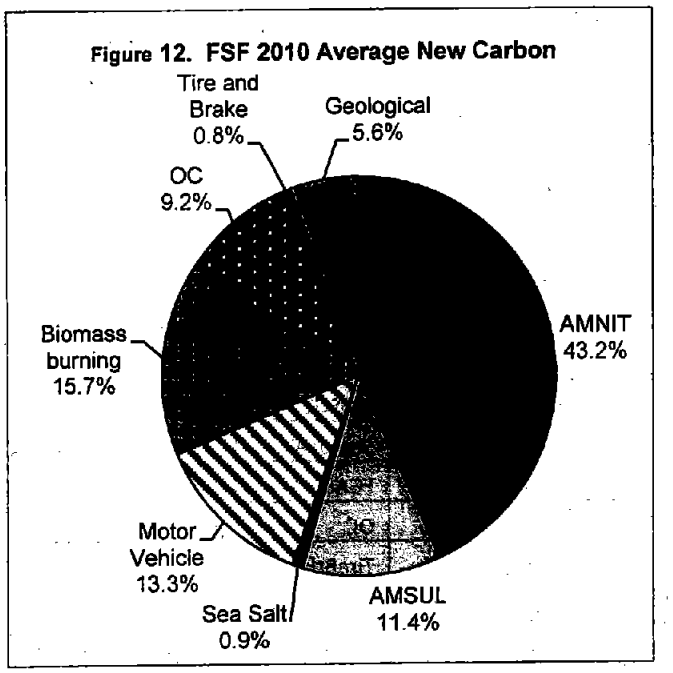
Table 11. FSF Source Contribution (%)

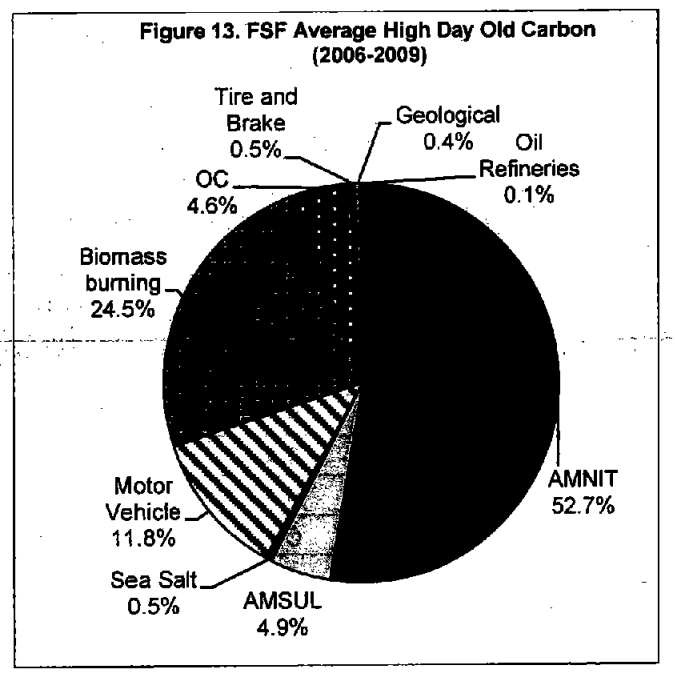
Source	Profile Name	Annual Average		High Days (>=30 ug/m3)	
		2006-2008	2010	2006-2009	2009-2010
# of samples	Obs Count	275	105	67	22
AMNIT	AMNIT	40.0	43.2	52.0	53.6
AMSUL	AMSUL	9.1	11.4	4.9	6.0
Biomass burning	WBOakEuc	16.5	15.7	18.7	22.9
Motor Vehicle	F9GASDI	11.1	13.3	9.3	11.5
OC	OC	17.5	9.2	13.4	4.4
Tire and Brake	TireBrk	0.8	0.8	0.5	0.5
Sea Salt	MARINE75	0.6	0.9	0.5	0.7
Geological	FDFREANN	4.2	5.6	0.5	0.3
Oil Combustion	CHCRUC	0.1	0.0	0.1	0.0

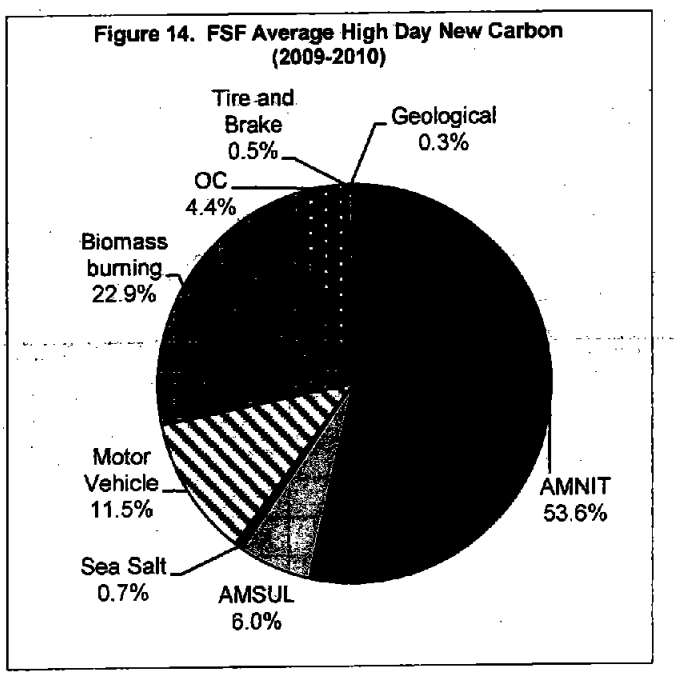
* AgBWheat from June through October, WBoakEuc the rest of the year

** F6GASDIE for old carbon and F9GASDIE for new carbon









Contributions on individual exceedance days are illustrated in Figures 15 through 18. The highest contribution from each source is also summarized in Tables 12 and 13.

Figure 15. PM2.5 Source Contribution on High Days 2006-2007
Bakersfield, Old Carbon

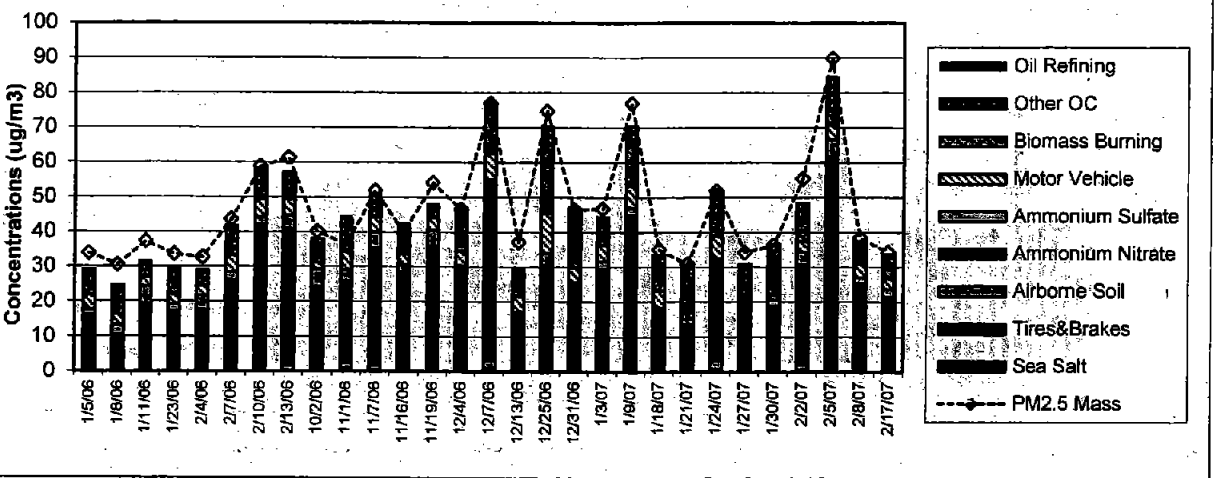


Figure 16. PM2.5 Source Contribution on High Days 2007-2010
Bakersfield, New Carbon

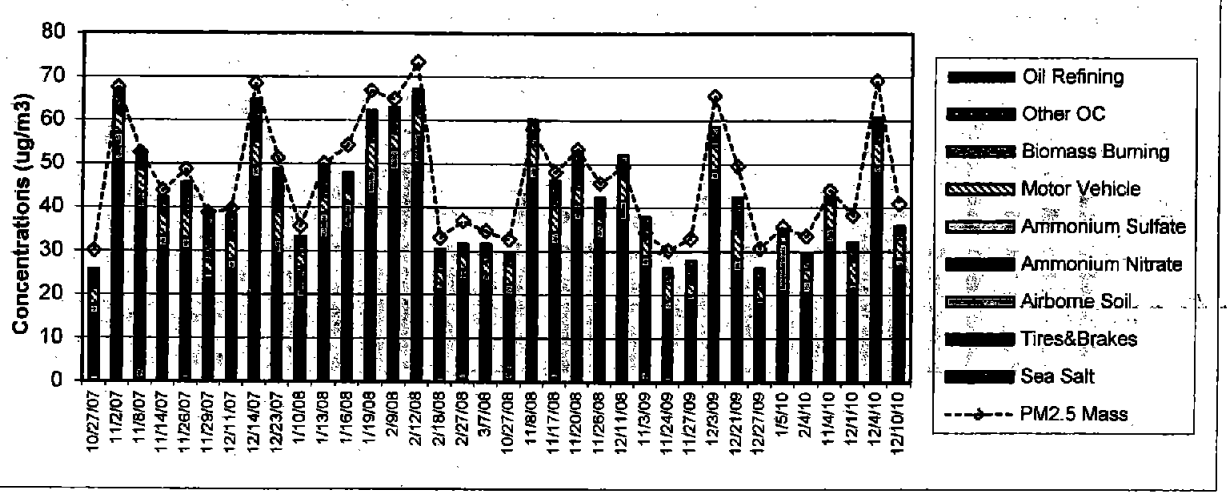


Figure 17. PM2.5 Source Contribution on High Days 2006-2009
Fresno, Old Carbon

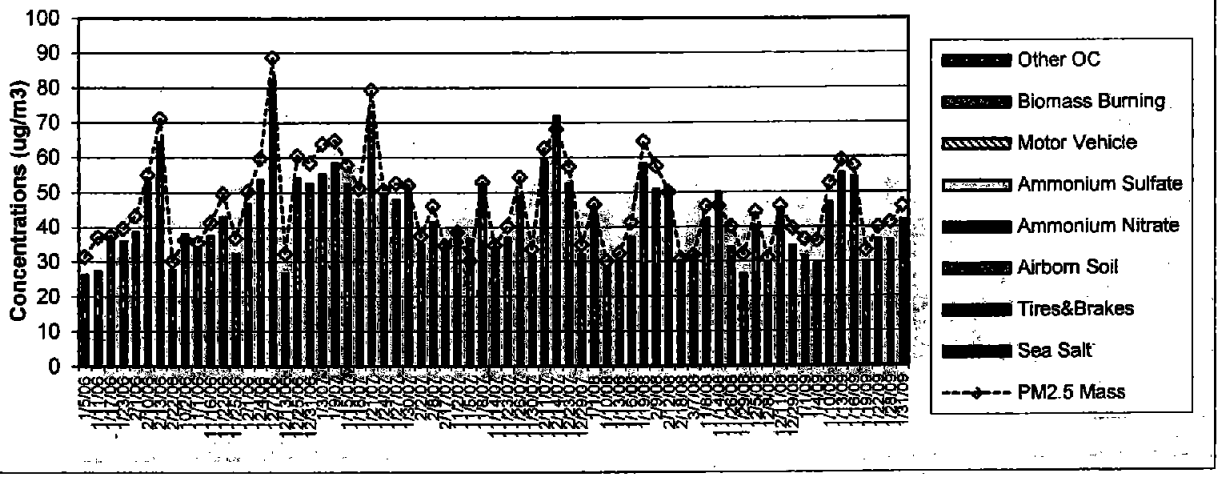


Figure 18. PM2.5 Source Contribution on High Days 2009-2010
Fresno, New Carbon

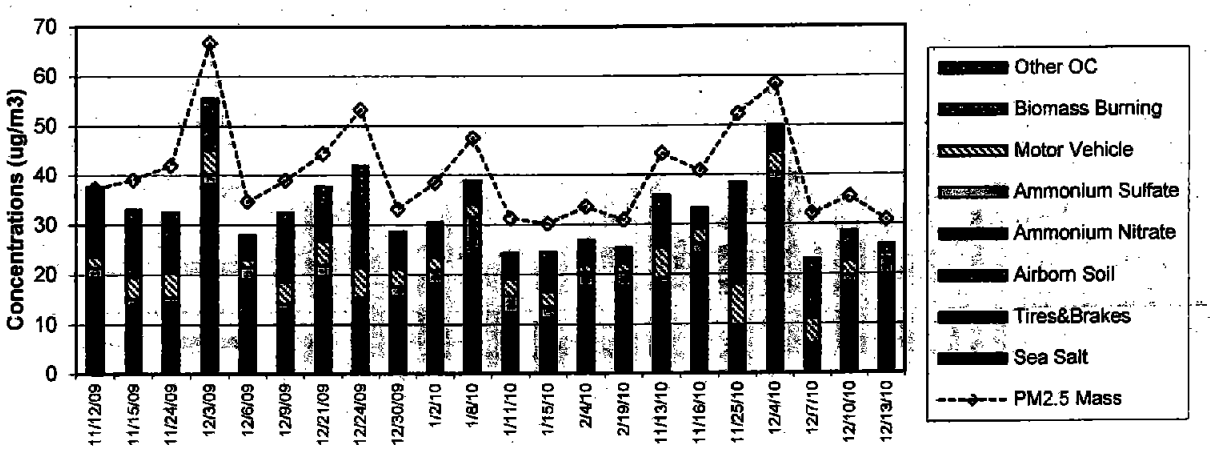


Table 12. BAC Highest Contribution by Source

Source	Old Carbon		New Carbon	
	Contribution (ug/m3)	Date	Contribution (ug/m3)	Date
Ammonium Nitrate	60	2/5/07	50	2/12/08
Ammonium Sulfate	5	10/2/06	11	1/5/10
Biomass Burning	18	12/25/06	12	11/29/07
Motor Vehicle	12	12/25/06	7	1/19/08
Other OC	9	2/5/07	5	2/12/08
Tire & Brake	0.6	1/24/07	0.8	12/4/10
Sea Salt	1	11/16/06	0.7	11/26/08
Geological	2.5	11/24/07	2.5	11/8/07
Oil Combustion	1	11/24/07	1	11/8/07

Table 13. FSF Highest Contribution by Source

Source	Old Carbon		New Carbon	
	Contribution (ug/m3)	Date	Contribution (ug/m3)	Date
Ammonium Nitrate	50	12/14/07	38	12/4/10
Ammonium Sulfate	5	12/23/07	7	1/8/10
Biomass Burning	21	1/1/08	19	11/25/10
Motor Vehicle	8	12/4/06	8	11/25/10
Other OC	13	1/19/08	6	12/24/09
Tire & Brake	0.6	12/7/06	0.4	11/24/09
Sea Salt	0.6	2/9/08	0.4	12/10/10
Geological	1.4	11/8/07	0.6	12/4/10
Oil Combustion	2	2/8/07		

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Fujita. E. M., Campbell, D., Zielinska, B., and Chow, J. C.: Kansas City PM Characterization Study, Round 1 Testing Report – Addendum A, Chemical Speciation, prepared for the U.S. Environmental Protection Agency, Desert Research Institute, Reno, NV, 2005.

Appendix A

Summary of Geological Profiles Used in CMB Modeling

Source Type	Subtype	County	Sample ID	Source
FDKERANN				
Agricultural Soil		Kern	Soil 31	Houck, et al, 1989
Paved Road	Urban	Kern	FDPVR1	Central California Fugitive Dust Study
Animal Husbandry	Feedlot (Composite)	Kern&Fresno	FDCTF	
Unpaved Road Dust	Unpaved Parking lot	Kern	Soil 13	Houck, et al, 1989
FDFREANN				
Paved Road		Fresno	Soil 03	Houck, et al, 1989
Agricultural Soil	Almonds (Composite)	Kern, Fresno, King, and Madera	FDALM	Central California Fugitive Dust Study
Agricultural Soil	Grapes	Fresno	FDGRA1	
Agricultural Soil	Tomato (Composite)	Fresno	FDTOM1	

San Joaquin Valley PM2.5 Weight of Evidence Analysis

Appendix 3

Source Apportionment of PM2.5 Measured at the Fresno and Bakersfield Chemical Speciation Network Sites in San Joaquin Valley Using the Positive Matrix Factorization Model

Source Apportionment of $PM_{2.5}$ Measured at the Fresno and Bakersfield Chemical Speciation Network Sites in San Joaquin Valley Using the Positive Matrix Factorization Model

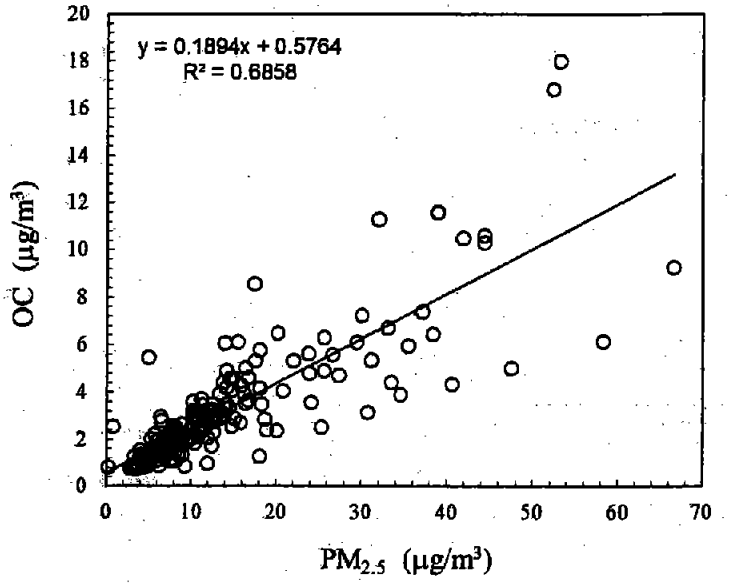
Sample Collection and Data Screening

$PM_{2.5}$ chemical speciation samples were collected on a one-in-three day schedule at the Fresno-First St. and Bakersfield-California Ave. Chemical Speciation Network (CSN) monitoring sites located in the San Joaquin Valley (SJV). There were good agreements between $PM_{2.5}$ data collected by the speciation samplers and the collocated Federal Reference Method (FRM) samplers in matched Fresno data (*340 samples, slope* = 1.00, *Intercept* = 1.08, r^2 = 0.97) and Bakersfield (*175 samples, slope* = 0.94, *Intercept* = 0.92, r^2 = 0.94) between 2008 and 2010.

The Thermal Optical Transmittance (TOT) protocol had been used to analyze carbon mass collected on the quartz filters. This method was changed to the Thermal Optical Reflectance (TOR) protocol and TOR organic carbon (OC) and elemental carbon (EC) concentrations were available starting from January 2008 and April 2009 at the Bakersfield and Fresno monitoring sites, respectively. Only the speciation data for which TOR OC and EC concentrations were available were considered in this source apportionment study.

Since a carbon denuder that minimizes the positive sampling artifact caused by adsorption of gaseous organic materials was not included upstream of quartz filter in the CSN samplers, and none of the reported CSN data were blank corrected, an integrated OC artifact concentration that includes OC adsorption and desorption was estimated utilizing the intercept of the regression of OC concentrations against $PM_{2.5}$ mass concentrations (Tolocka et al. 2001, Kim et al. 2005). Samples for which $PM_{2.5}$ or OC concentrations had an error flag and samples for which the $PM_{2.5}$ or OC data were not available were excluded from the regression analysis between $PM_{2.5}$ and OC concentrations. Comparing co-located $PM_{2.5}$ data measured by CSN and FRM samplers, and comparing $PM_{2.5}$ and Sulfur (S) concentrations, outliers were censored for the two data sets. Using 189 data points out of 353 data points between 2009 and 2010 at Fresno and 187 data points out of 192 data points at Bakersfield between 2008 and 2010, the intercept s of 0.576 $\mu g/m^3$ and 1.480 $\mu g/m^3$ in $PM_{2.5}$ regression against OC concentrations are considered to be the integrated OC artifact concentrations at Fresno and Bakersfield, respectively (Figure 1). The OC concentrations analyzed in this study were corrected by subtracting the integrated OC artifact concentrations.

Fresno-First St.



Bakersfield-California Ave.

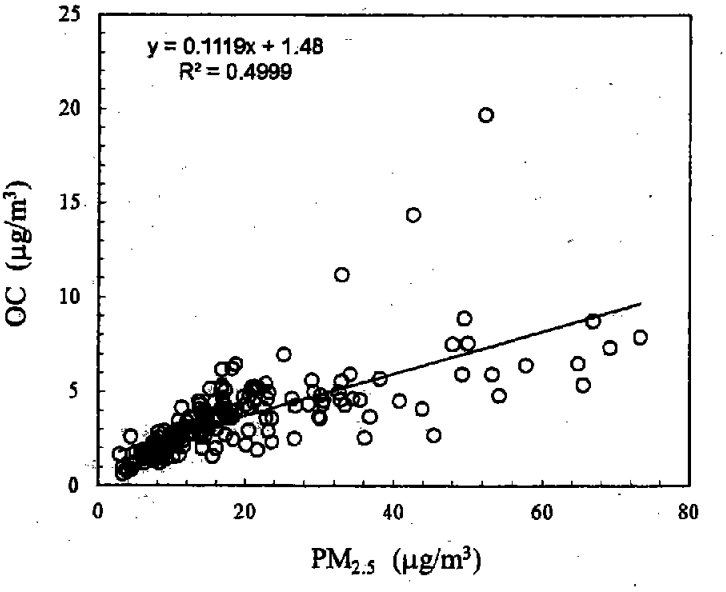


Figure 1. OC artifact estimations: $PM_{2.5}$ concentrations versus OC concentrations.

The Positive matrix factorization model version 2 (PMF2) model was used for the source apportionment of $PM_{2.5}$ at the Fresno and Bakersfield monitoring sites. Samples were excluded from the data set for which the $PM_{2.5}$, artifact corrected OC, or EC data were not available or below zero, or for which $PM_{2.5}$ artifact corrected OC, or EC had an error flag. Samples for which the sum of all measured species were larger than twice the $PM_{2.5}$ concentrations or the sum of all measured species were less than 50% of $PM_{2.5}$ concentrations were also excluded. Finally, samples that contain fireworks particles collected on Independence Day and New Year's Day were excluded since they had unusually high concentrations of OC, EC, K^+, Na^+ and metals. Overall, 10.3% of the Fresno data and 16.5% of the Bakersfield data were excluded in this study.

For the chemical species screening, X-Ray Fluorescence (XRF) S was excluded from the analyses to prevent double counting of mass concentrations. Due to the higher analytical precision compared to XRF Na and XRF K, IC Na^+ and IC K^+ were included in the analyses. Chemical species below MDL values more than 90% were excluded. As recommended by Paatero and Hopke (2003), the species that had a Signal-to-Noise (*S/N*) ratio below 0.2 were excluded. Thus, a total of 174 samples and 21 species including $PM_{2.5}$ mass concentrations collected between April 2009 and December 2010 were used for the Fresno site. For the Bakersfield site, a total of 147 samples and 24 species including $PM_{2.5}$ mass concentrations collected between January 2008 and December 2010 were used. Since new TOR OC and EC concentrations were not accompanied by detection limit and uncertainty values, a comprehensive set of uncertainty structure (i.e., 7% of measured concentration) estimated by Kim et al. (2005) and 0.1 $\mu g/m^3$ of detection limit value estimated from the State and Local Air Monitoring Stations (SLAM) speciation data were used in this study. Summaries of $PM_{2.5}$ speciation data are provided in Tables A1 and A2 in the Appendix.

The procedure of Polissar et al. (1998) was used to assign input data for PMF2. The measurement values are used for the input concentration data, and the sum of the analytical uncertainty and one-third of the detection limit value is used as the input uncertainty data assigned to each measured value. Concentration values below the detection limit are replaced by half of the detection limit values, and their input uncertainties are set at five-sixth of the detection limit values. Missing values are replaced by the geometric mean of the measured values for each species. To down-weight these replaced data and then to reduce their influence on the solution, their accompanying uncertainties are set at four times the geometric mean value. The conditional probability function (CPF) analysis was used to estimate the possible directions of the local source impacts (Kim and Hopke, 2004). The CPF was calculated for each source using the PMF2 source contributions coupled with wind data. As recommended by Paatero and Hopke (2003), which is to down-weight the variable in the analysis so that the noise does not compromise the solution, it was found necessary to increase the input uncertainties of OC, EC, and Cl by a factor of 3 for the Fresno data and OC and Na^+ by a factor of 3 for the Bakersfield data to obtain physically interpretable PMF2 results.

PMF Results

Seven major sources were resolved from PMF2 analyses for both sites (matrix rotational parameter: Fresno FPEAK = 0.1; Bakersfield FPEAK = 0). The comparison of the reconstructed $PM_{2.5}$ contributions (sum of contributions from all sources) with measured $PM_{2.5}$ concentrations shown in Figure 2 indicates that the resolved sources effectively reproduce the measured values and account for most of the variation in the $PM_{2.5}$ concentrations (*slope* = 0.88, r^2 = 0.95 for Fresno data; *slope* = 0.93, r^2 = 0.91 for Bakersfield data).

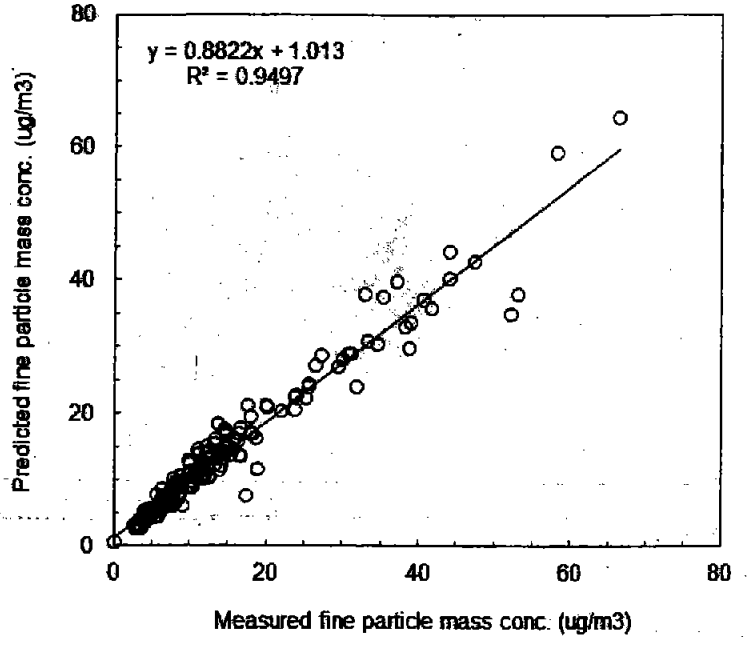
Average Source Contributions

As shown in Figure 3 and Table A3 which present average source contributions, secondary nitrate contributed the most at both sites (35% at the Fresno site, 41% at the Bakersfield site). The pie charts indicate that three major sources (i.e., secondary nitrate, secondary sulfate, and motor vehicle) contributed 74% of $PM_{2.5}$ concentrations at both sites. Figure 4 shows monthly average source contributions. Secondary nitrate, motor vehicle, and biomass smoke contributed the most in winter. The source profiles, corresponding source contributions, weekday/weekend variations, monthly averaged source contributions, and potential source directions are presented in Figures A1 through A10 in the Appendix.

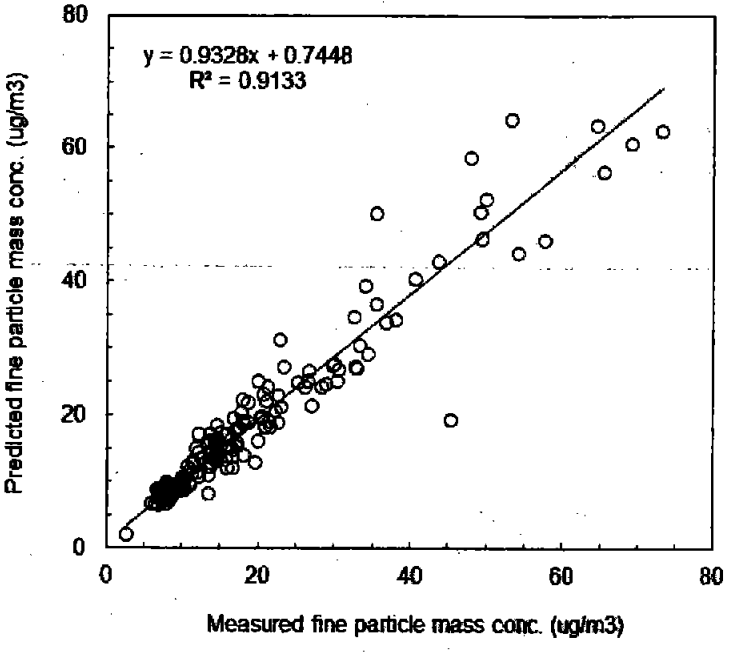
The secondary nitrate factor was identified by its high concentration of NO_3^- and NH_4^+. It consisted of NH_4NO_3 and several minor species such as secondary OC and EC that transport together. It contributed the most at both sites, accounting for 35% and 41% of the $PM_{2.5}$ mass concentrations at Fresno and Bakersfield, respectively. Bakersfield showed higher secondary nitrate concentrations than Fresno. Secondary nitrate particles had winter- high trends at both sites. Secondary sulfate was identified by its high concentration of SO_4^{2-} and NH_4^+ and accounted for 27% and 20% of the $PM_{2.5}$ mass concentration at Fresno and Bakersfield, respectively. Secondary nitrate and secondary sulfate did not show clear weekday/weekend variations. Secondary sulfate showed seasonal variations with higher concentrations in summer when the photochemical activity was highest at both sites. The CPF plots for secondary nitrate pointed S and NE at both sites. The CPF plots for secondary sulfate pointed SE at the Fresno site and SW at the Bakersfield site.

The motor vehicle factor was identified by its high concentration of OC, EC, NO_3^-, and minor species such as Fe (Watson et al., 1994). Motor vehicle emissions contributed 12% and 13% of the $PM_{2.5}$ mass concentrations at Fresno and Bakersfield, respectively. Motor vehicle emissions did not show clear weekday/weekend variations at either site, however there was a winter-high seasonal trend.

The biomass smoke factor was characterized by OC, EC, and K^+ (Watson et al., 2001) and contributed 11% and 10% to the $PM_{2.5}$ mass concentrations at Fresno and Bakersfield, respectively. The biomass smoke category reflects contributions from residential wood burning and smoke from commercial cooking. The biomass smoke did not show weekday/weekend variations. The biomass smoke did show winter-high trends suggesting that it was mostly contributed by residential wood burning. The CPF plots for the biomass smoke pointed to high contributions from NE and S at both sites.



Fresno-First St.



Bakersfield-California Ave.

Figure 2. Measured versus PMF predicted $PM_{2.5}$ mass concentrations.

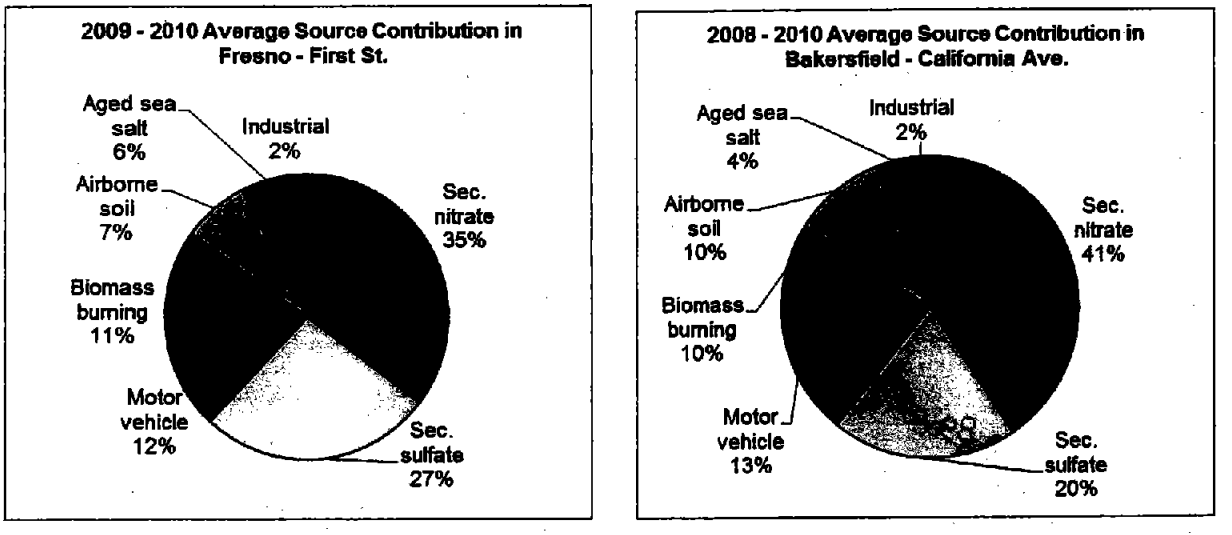


Figure 3. Average source contributions.

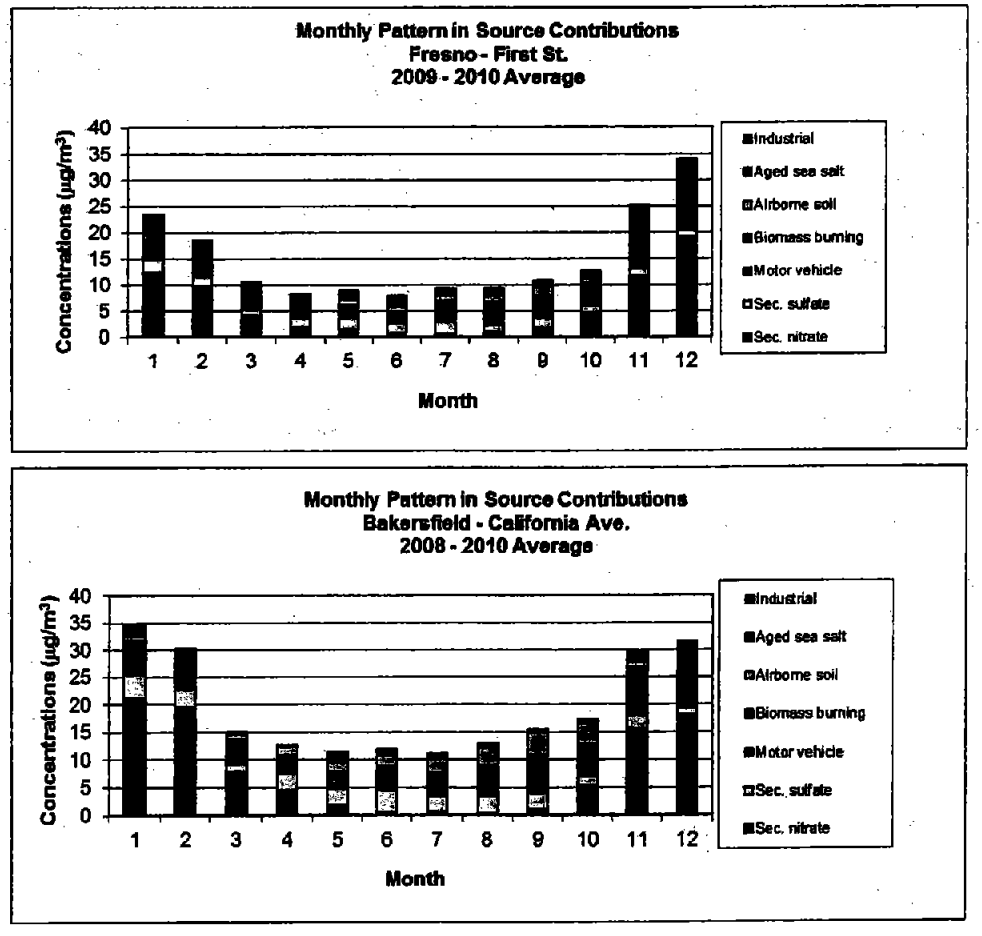


Figure 4. Monthly average source contributions.

The airborne soil factor was identified by its high concentrations of Si, Al, Ca and Fe. It contributed 7% and 10% to the $PM_{2.5}$ mass concentration at Fresno and Bakersfield, respectively. Airborne soil reflects wind-blown dust as well as re-suspended crustal materials by road traffic as indicated by the presence of OC or EC in the source profiles. Airborne soil did not show clear weekday/weekend variation. Both sites exhibited autumn-high seasonal trends. The CPF plots for airborne soil suggested high contributions from SW and S at both sites.

The aged sea salt factor was represented by its high concentrations of NO_3^-, SO_4^{2-}, and Na^+, accounting for 6% the $PM_{2.5}$ mass concentration at Fresno and 4% at Bakersfield. Aged sea salt reflects particles in which Cl^- in the fresh sea salt is partially displaced by acidic gases during the transport and collected along with NO_3^- and SO_4^{2-} (Song and Carmichael, 1999). Aged sea salt did not show weekday/weekend variation at either site. Aged sea salt had high contributions in summer at the Fresno site. Interestingly, it had a high contribution in winter at the Bakersfield site. The CPF plot for aged sea salt at Fresno site pointed towards NE. The CPF plot for aged sea salt at Bakersfield site suggested high contributions from NE and S.

A possible industrial source such as metal processing that was characterized by OC, EC, Fe, and Zn was identified at both sites. This source accounted for 2% of the $PM_{2.5}$ mass concentrations at both sites. It showed weak weekday-high variations at the Bakersfield site. The industrial source showed winter-high variations at the Fresno site. The CPF plot suggested high contributions from NE and SW at both sites.

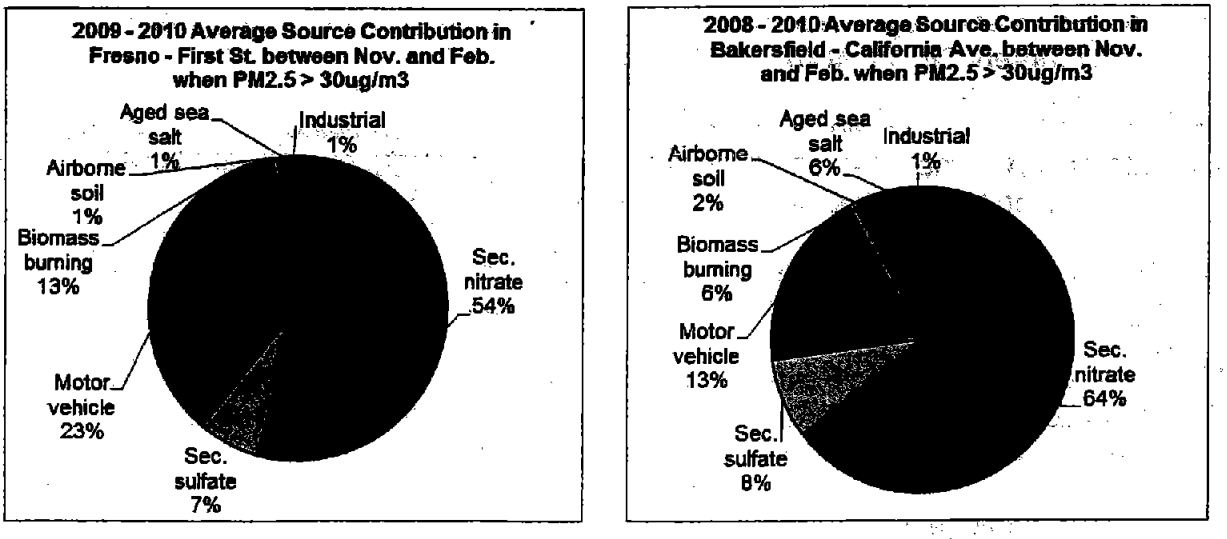


Figure 5. Average source contributions in Fresno – First St. and Bakersfield – California Ave. when $PM_{2.5}$ concentrations were higher than 30 $\mu g/m^3$ in the high $PM_{2.5}$ season (Nov. - Feb.).

Higher $PM_{2.5}$ Day Contributions

The average source contributions when $PM_{2.5}$ concentrations were higher than 30 $\mu g/m^3$ in the high $PM_{2.5}$ season (Nov. - Feb.) are shown in Figure 5 for percentiles and in Table A4 for mass concentrations. The contributions from secondary nitrate and motor vehicle were increased from 35% up to 54% and from 12% up to 23%, respectively, at the Fresno site. The biomass burning contributions also increased slightly from 11% up to 13% at Fresno site. At the Bakersfield site, the contributions from secondary nitrate increased from 41% up to 64% and aged sea salt from 4% up to 6%.

Conclusions

$PM_{2.5}$ speciation and related meteorological data collected at the Fresno-First St. and Bakersfield-California Ave. CSN monitoring sites between 2008 and 2010 were analyzed by PMF2. Seven major $PM_{2.5}$ sources were identified at both monitoring sites: secondary nitrate, secondary sulfate, motor vehicle, biomass smoke, airborne soil, aged sea salt, and industrial. Annual average and high day source contributions showed that secondary nitrate, secondary sulfate, motor vehicles, and biomass burning were the largest contributors to $PM_{2.5}$ concentrations.

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APPENDIX

Table A1. Summary of $PM_{2.5}$ species mass concentrations at Fresno.

Species	Arithmetic mean ($\mu g/m^3$)	Geometric mean ($\mu g/m^3$)	Minimum ($\mu g/m^3$)	Maximum ($\mu g/m^3$)	Number of below MDL values (%)
$PM_{2.5}$	14.5649	11.2762	0.3000	66.6000	0.6
OC	2.7861	1.9428	0.1600	17.4240	0.0
EC	0.7934	0.5764	0.0769	5.0400	0.6
SO4	1.2507	1.1155	0.2440	5.3900	0.6
NO^{3-}	3.6499	1.9445	0.0445	29.1000	0
NH_4^+	1.3964	0.8936	0.1380	9.3500	0.6
Al	0.0646	0.0418	0.0013	0.6330	25.3
Br	0.0042	0.0032	0.0001	0.0338	15.5
Ca	0.0420	0.0310	0.0027	0.2860	4.0
Cl	0.0563	0.0156	0.0001	0.5130	40.2
Cr	0.0026	0.0018	0.0000	0.0387	75.3
Cu	0.0044	0.0032	0.0001	0.0163	28.7
Fe	0.1007	0.0843	0.0129	0.6890	0
K^+	0.1072	0.0770	0.0169	0.6460	32.8
Mg	0.0200	0.0138	0.0002	0.1140	68.4
Mn	0.0019	0.0015	0.0000	0.0126	62.1
Na^+	0.1373	0.0972	0.0176	0.8720	3.4
Ni	0.0074	0.0017	0.0000	0.1850	65.5
Si	0.1682	0.1100	0.0006	1.6400	1.7
Ti	0.0057	0.0043	0.0001	0.0448	61.5
Zn	0.0067	0.0045	0.0004	0.0296	25.3

Table A2. Summary of $PM_{2.5}$ species mass concentrations at Bakersfield.

Species	Arithmetic mean ($\mu g/m^3$)	Geometric mean ($\mu g/m^3$)	Minimum ($\mu g/m^3$)	Maximum ($\mu g/m^3$)	Number of below MDL values (%)
$PM_{2.5}$	20.9253	17.1631	2.9000	73.3000	0
OC	2.4981	1.7591	0.0400	18.2200	1.3
EC	1.1390	0.9764	0.2160	3.0900	0
SO4	1.6927	1.4718	0.1200	8.0600	0
NO^{3-}	6.4908	3.2626	0.3520	35.7000	0
NH_4^+	2.5874	1.5187	0.3160	14.8000	0.7
Al	0.1276	0.0818	0.0013	1.0800	12.7
As	0.0015	0.0013	0.0001	0.0056	73.3
Br	0.0058	0.0048	0.0001	0.0299	4.7
Ca	0.1096	0.0791	0.0065	0.6770	1.3
Cl	0.0436	0.0192	0.0002	0.3270	26.0
Co	0.0013	0.0010	0.0000	0.0047	76.0
Cr	0.0021	0.0016	0.0001	0.0156	80.0
Cu	0.0089	0.0064	0.0002	0.0570	10.0
Fe	0.1923	0.1555	0.0020	1.0900	0
K^+	0.1091	0.0931	0.0183	0.5280	16.0
Mg	0.0238	0.0160	0.0002	0.2310	60.7
Mn	0.0034	0.0025	0.0003	0.0276	32.7
Na^+	0.1556	0.1229	0.0168	0.6980	1.3
Ni	0.0010	0.0009	0.0000	0.0042	84.7
Si	0.3586	0.2322	0.0217	3.4300	0.7
Sr	0.0019	0.0017	0.0001	0.0120	84.0
Ti	0.0103	0.0068	0.0001	0.0818	46.7
Zn	0.0127	0.0084	0.0006	0.1300	8.7

Table A3. Average source contributions ($\mu g/m^3$) to $PM_{2.5}$ mass concentration.

Sources	Average source contribution (± 95 % distribution)	
	Fresno	Bakersfield
Secondary nitrate	4.89 (1.09)	8.07 (1.85)
Secondary sulfate	1.72 (0.16)	2.60 (0.39)
Motor vehicle	3.70 (0.44)	4.01 (0.39)
Biomass smoke	1.47 (0.28)	2.02 (0.28)
Airborne soil	0.83 (0.14)	1.97 (0.37)
Aged sea salt	1.04 (0.16)	0.79 (0.22)
Industrial	0.22 (0.03)	0.40 (0.11)
Estimated $PM_{2.5}$ ($\mu g/m^3$)	13.86 (1.57)	19.85 (2.27)
Measured $PM_{2.5}$ ($\mu g/m^3$)	14.56 (1.74)	20.48 (2.33)

Table A4. Average source contributions ($\mu g/m^3$) to $PM_{2.5}$ mass concentration at Fresno-First St. and Bakersfield-California Ave. when $PM_{2.5}$ mass concentrations were higher than 30 $\mu g/m^3$ between Nov. and Feb.

Sources	Average source contribution (Nov. – Feb.)	
	Fresno	Bakersfield
Secondary nitrate	20.14	28.83
Secondary sulfate	2.42	3.80
Motor vehicle	8.58	5.69
Biomass smoke	4.87	2.83
Airborne soil	0.18	0.71
Aged sea salt	0.47	2.52
Industrial	0.35	0.38
No. of days	21	25

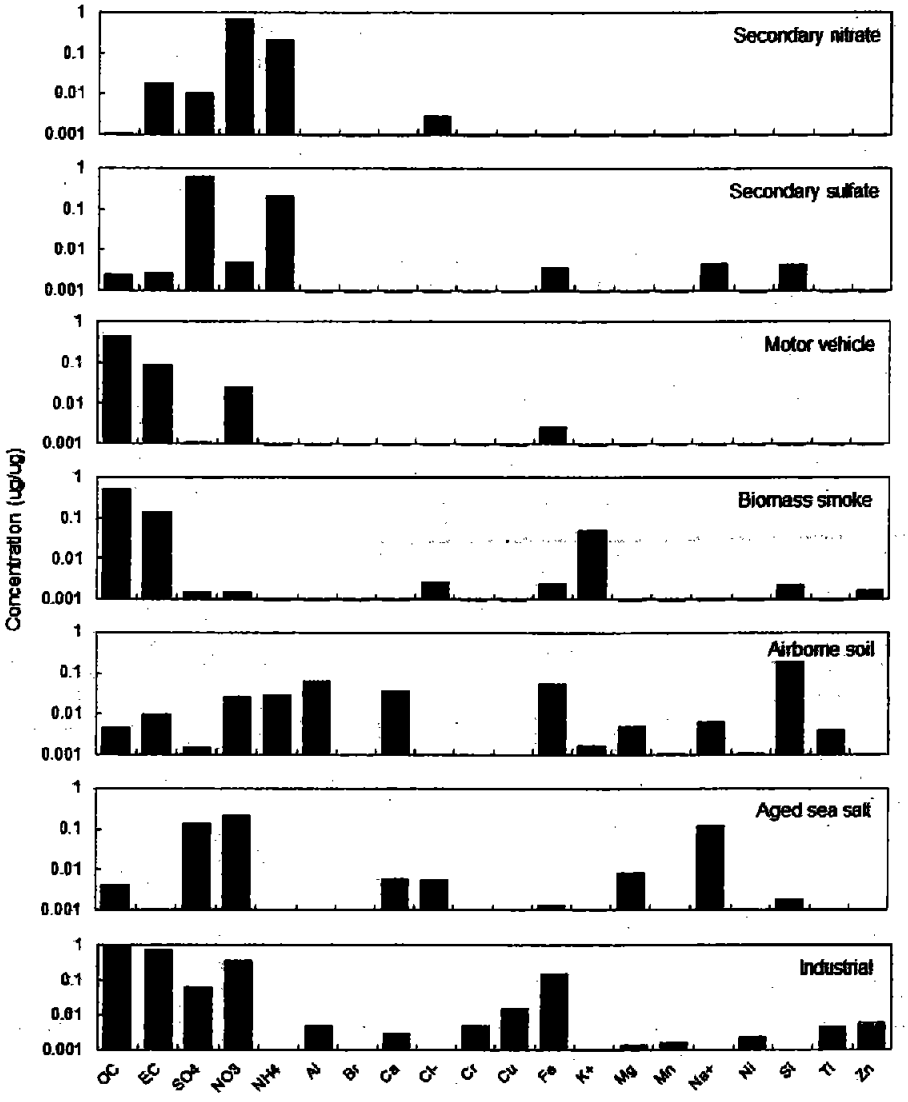


Figure A1. Source profiles deduced from $PM_{2.5}$ samples measured at Fresno-First St. (prediction ± standard deviation).

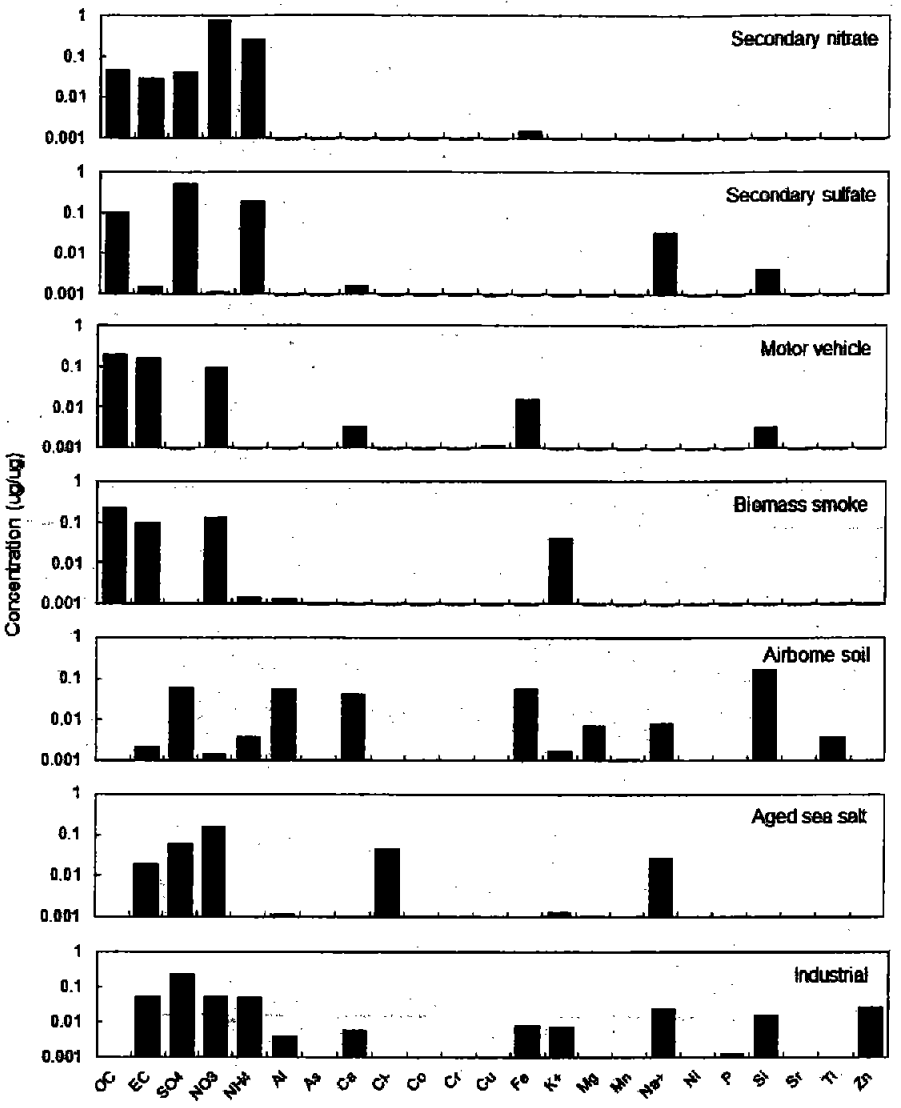


Figure A2. Source profiles deduced from $PM_{2.5}$ samples measured at Bakersfield-California Ave. (prediction ± standard deviation).

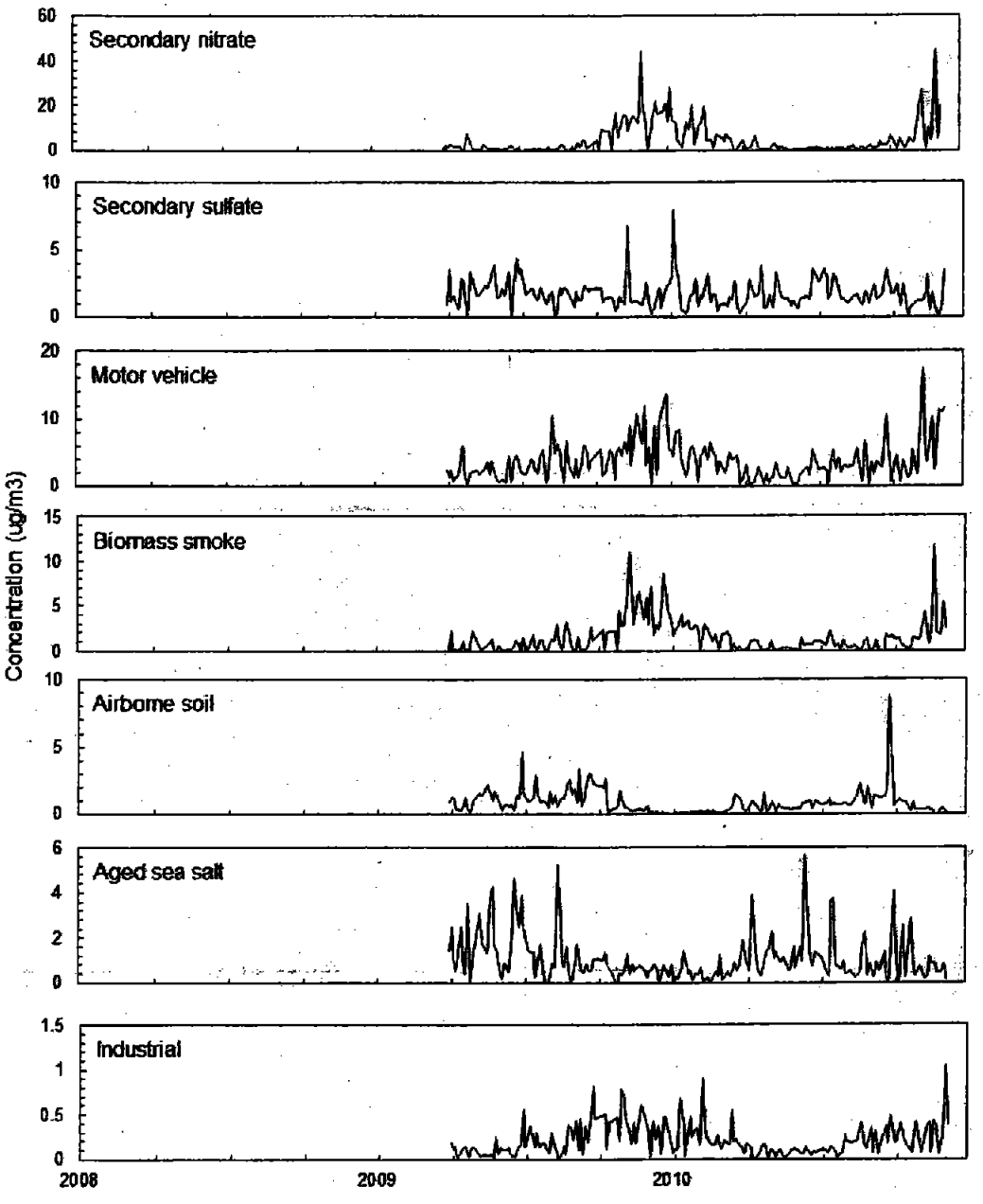


Figure A3. Source contributions deduced from $PM_{2.5}$ samples measured at Fresno-First St.

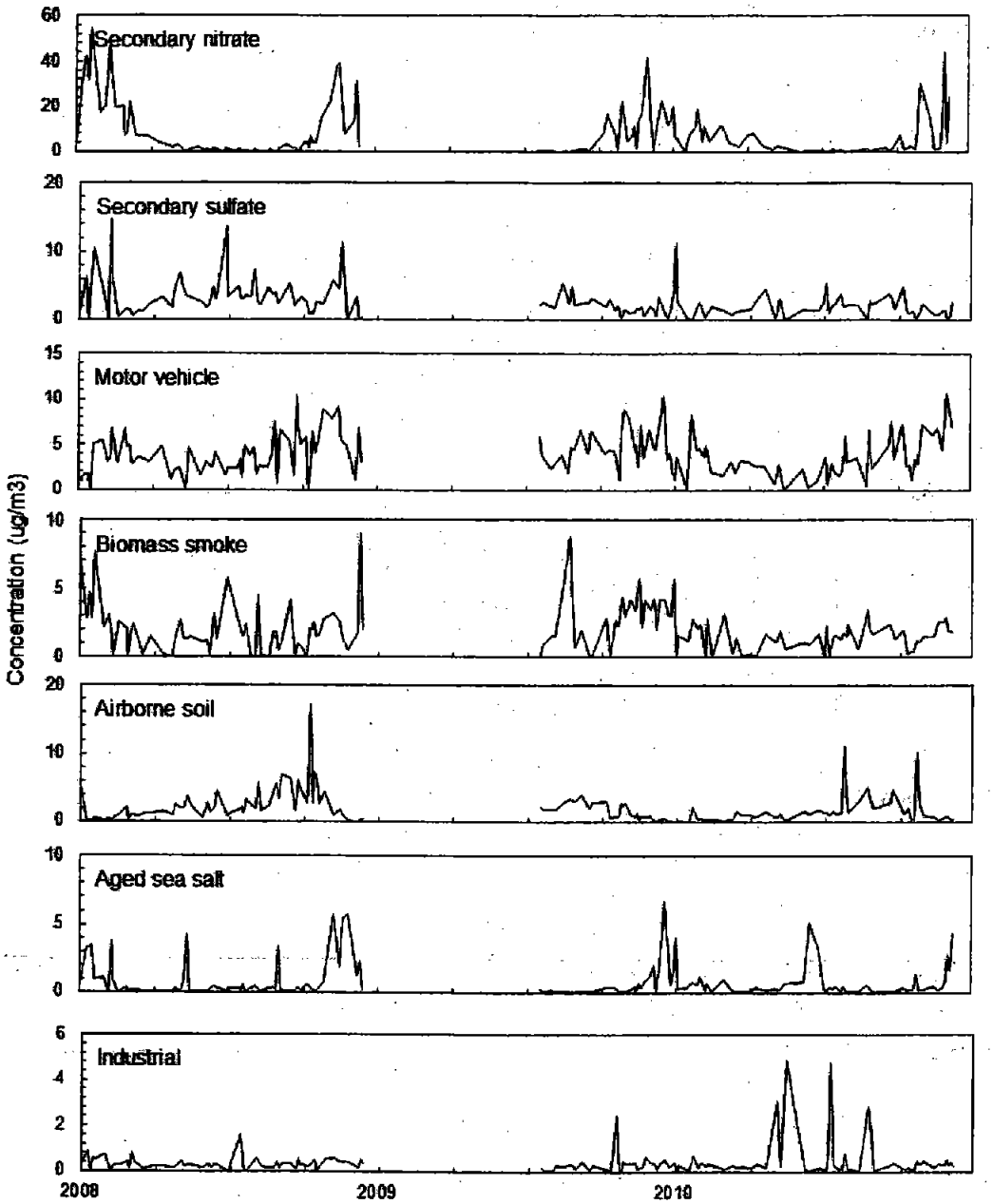


Figure A4. Source contributions deduced from $PM_{2.5}$ samples measured at Bakersfield-California Ave. (missing data: Jan. - Jun. 2009)

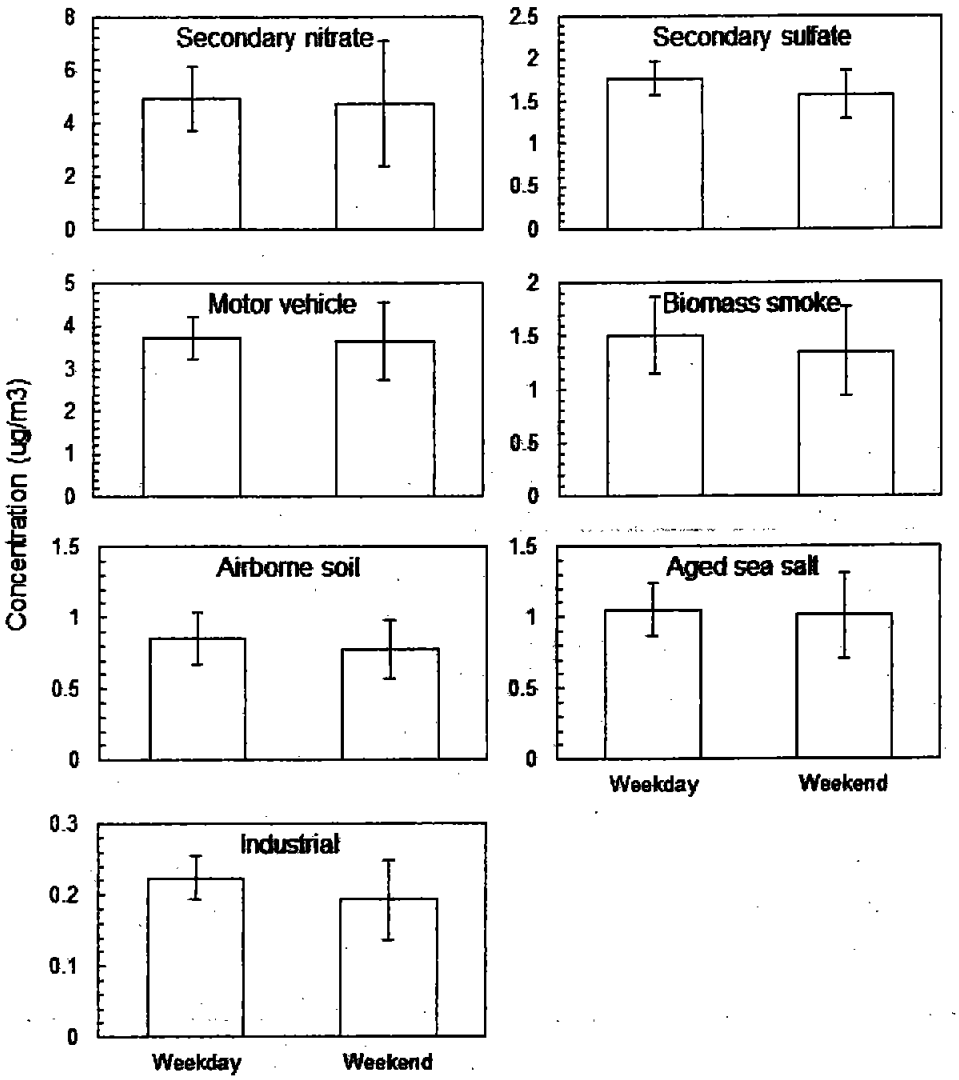


Figure A5. Weekday/weekend variations at Fresno-First St. (mean ± 95 % distribution).

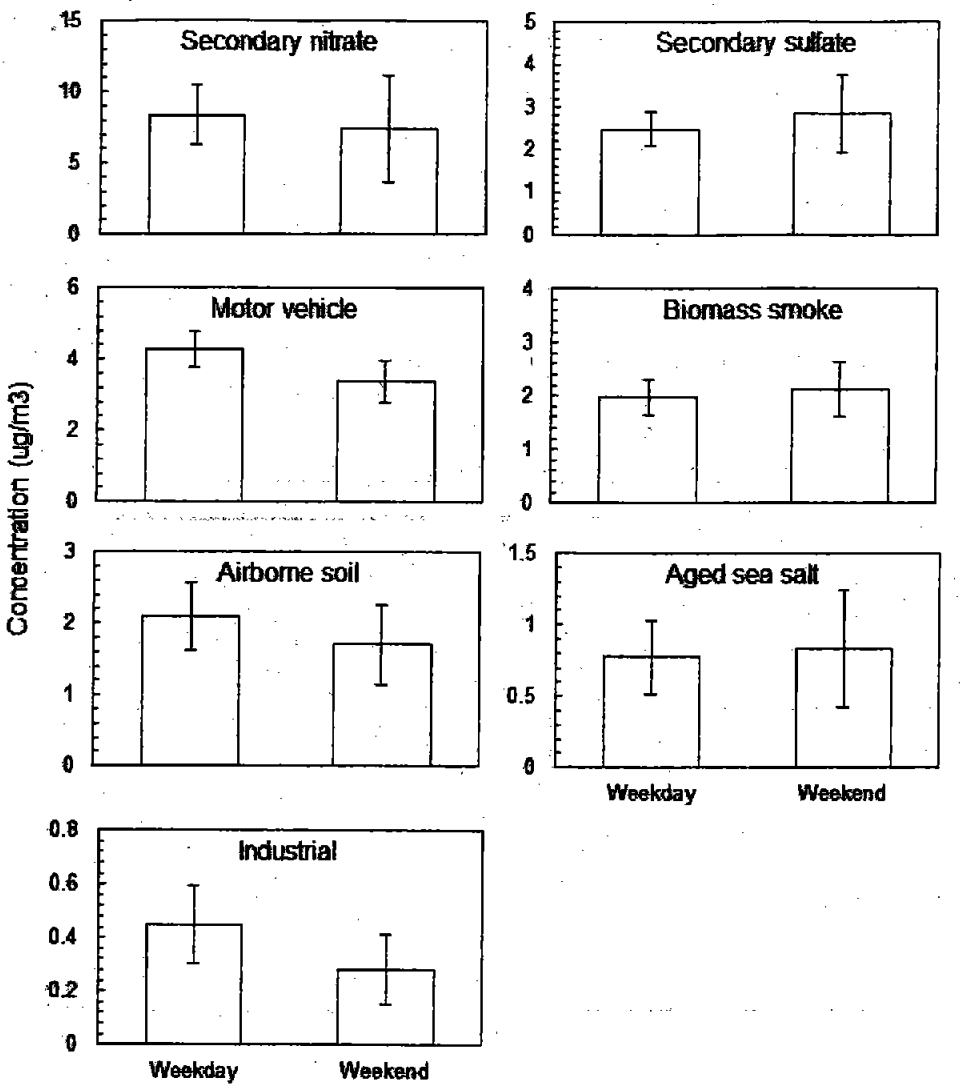


Figure A6. Weekday/weekend variations at Bakersfield-California Ave. (mean ± 95 % distribution).

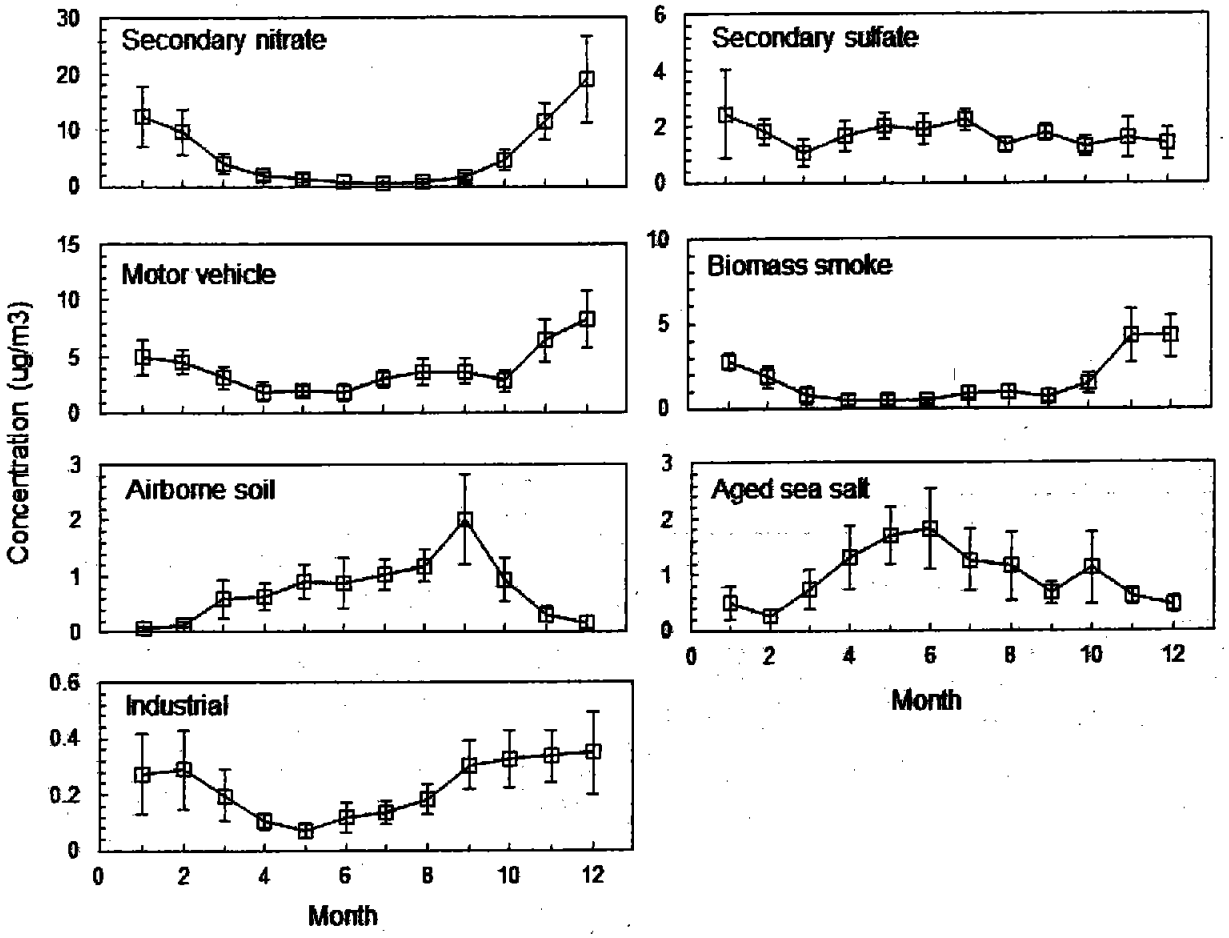


Figure A7. The monthly variations of source contributions to $PM_{2.5}$ mass concentration at Fresno-First St. (mean ± 95 % distribution).

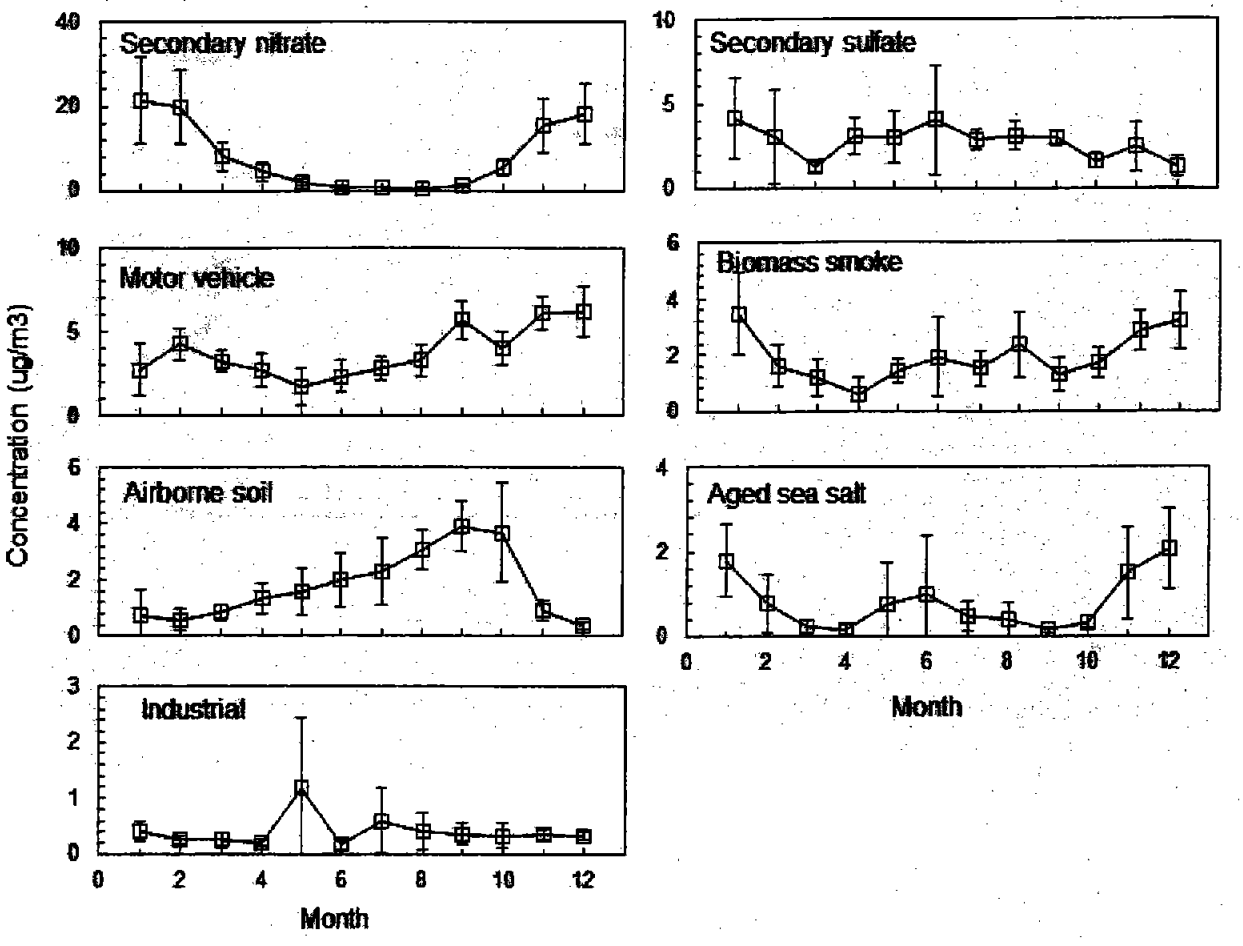
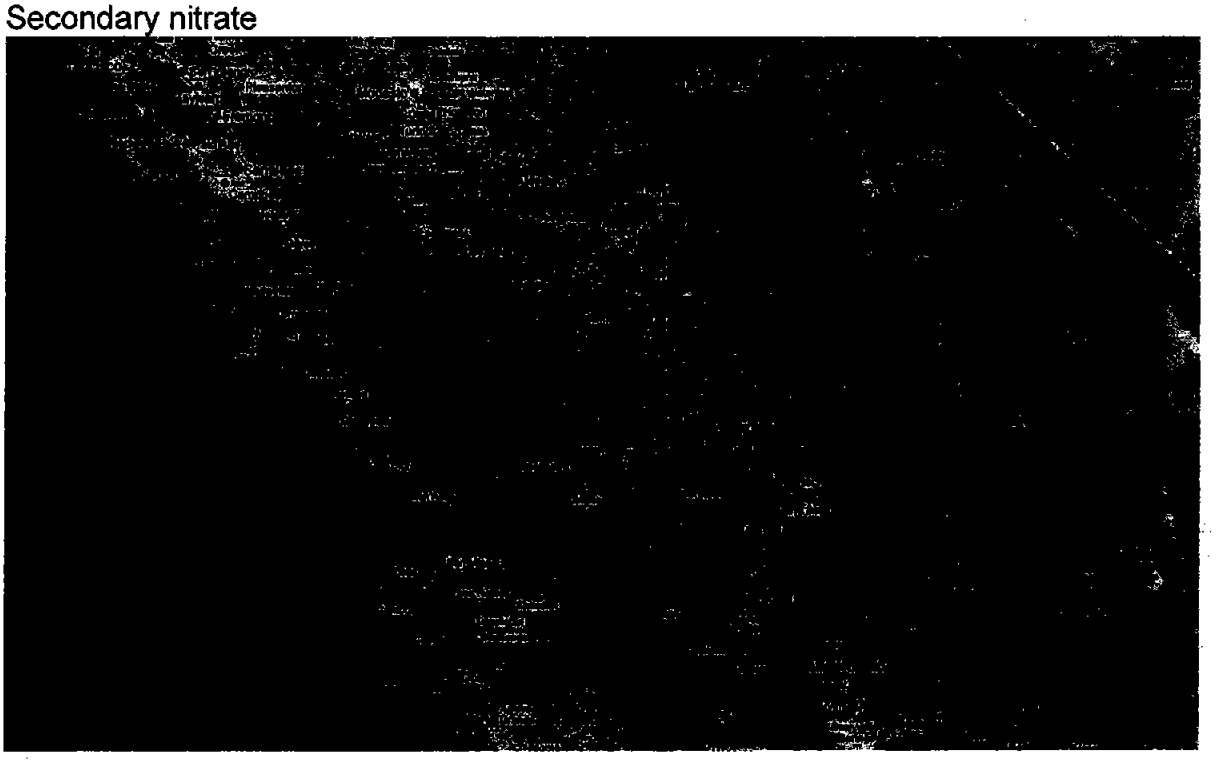


Figure A8. The monthly variations of source contributions to $PM_{2.5}$ mass concentration at Bakersfield-California Ave. (mean ± 95 % distribution).



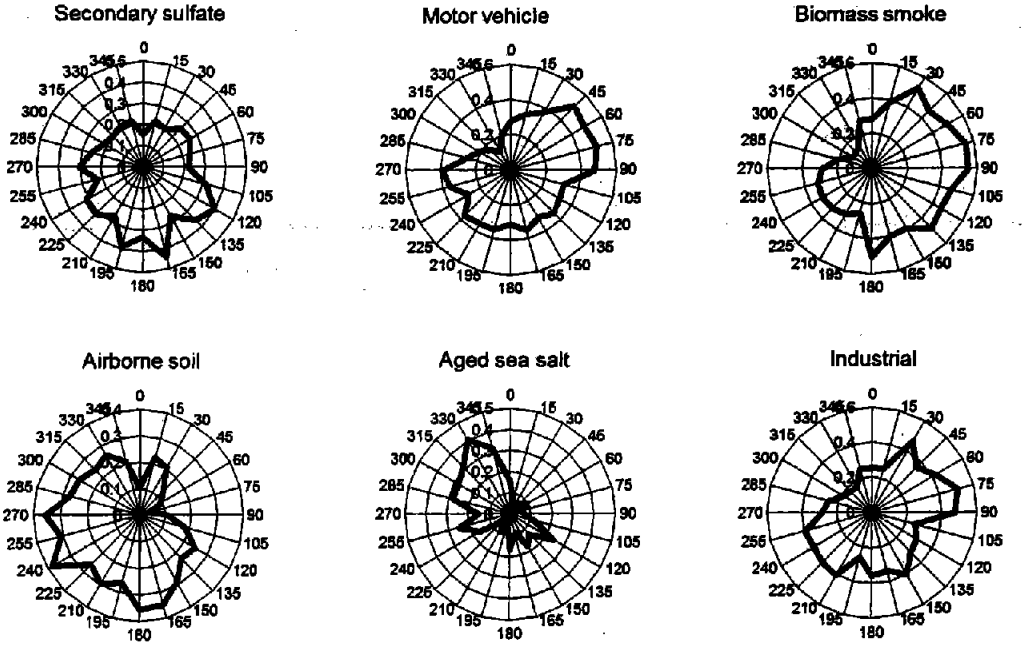
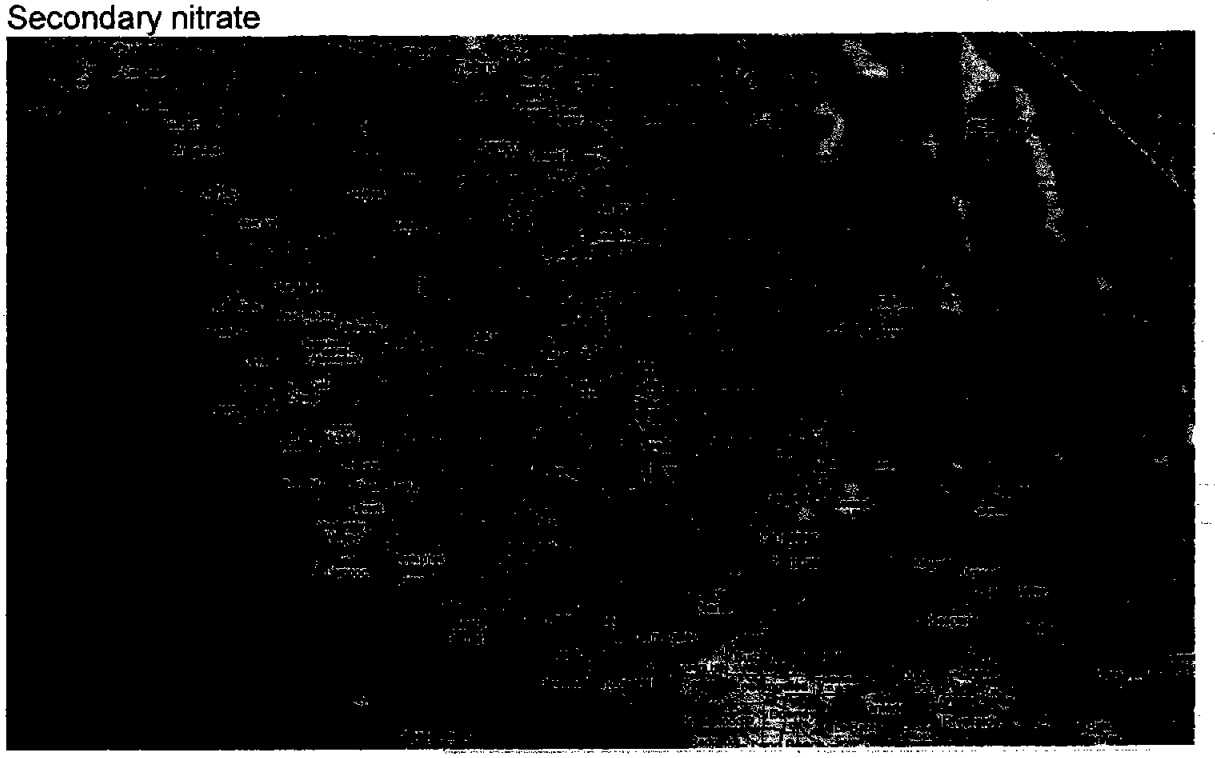


Figure A9. Conditional probability function plots for the highest 25% of the mass contributions at Fresno-First St.

Secondary nitrate



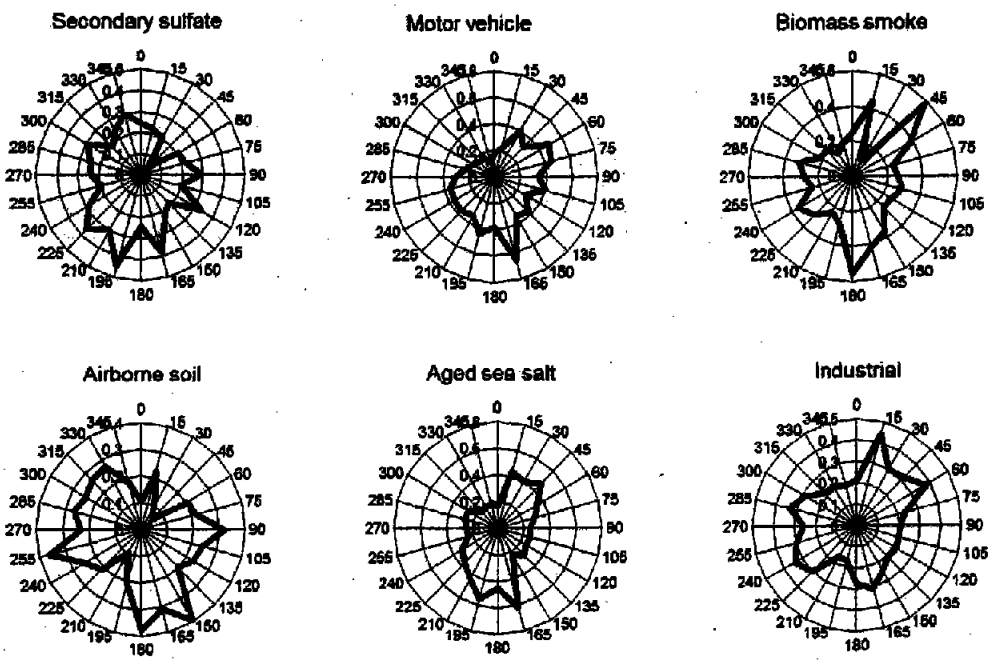


Figure A10. Conditional probability function plots for the highest 25% of the mass contributions at Bakersfield-California Ave.

San Joaquin Valley PM2.5 Weight of Evidence Analysis

Appendix 4

Methodology for Meteorological Adjustment of PM2.5 Trend Statistics

Introduction

Air quality trends can help reveal the effects of emission control strategies and regulations on ambient air pollution levels. However, meteorological conditions also affect pollutant levels and can obscure the effects of changing emissions on ambient air pollution levels over time. If the met-effects can be identified, quantified, and removed, the met-adjusted trends may reveal the emissions-induced trends with greater clarity.

For the San Joaquin Valley PM2.5 SIP, met-adjusted trends were prepared for annual average PM2.5 and for PM2.5 exceedance days. This Technical Appendix presents the methodology used to construct the met-adjusted trends.

1. Data Acquisition and Preparation

PM2.5 mass concentrations from the air quality monitoring sites in two major urban centers of the SJV (Bakersfield and Fresno) were collected. Meteorological data for factors that may impact the PM2.5 concentrations were also acquired from various meteorological monitoring networks. Monitors at ground level provided temperature, relatively humidity, pressure, wind speed, wind direction, precipitation, and solar radiation data. For various reasons, surface pressure, wind direction, precipitation, and solar radiation were not used in the final analysis. Routine rawinsondes (weather balloons) at Oakland provided data for 500 millibar heights and 850 millibar temperatures. These surface and upper air factors are consistent with studies of meteorological conditions associated with daily PM2.5 levels [Dye et al., 2003].

Table 1 lists the air quality and meteorological monitoring sites that provided data used in this analysis. The PM2.5 and meteorological data presented are daily regional averages of the data collected from the sites in Table 1.

Table 1. Air quality and meteorological monitoring sites

Region	Air Quality Sites	Meteorological Sites
Bakersfield Area	Bakersfield-Golden State Highway, Bakersfield-5558 California Avenue, Bakersfield-410 E Planz Road	Oakland (Upper Air), Mercury/Desert Rock (Upper Air), Vandenberg AFB (Upper Air), Bakersfield-Golden State Highway, Bakersfield-5558 California Avenue, Oildale-3311 Manor Street, Shafter-Walker Street, Arvin-Edison, Belridge
Fresno Area	Fresno-1st Street, Clovis-N Villa Avenue Fresno-Hamilton and Winery	Oakland (Upper Air) Fresno-1st Street Clovis-N Villa Avenue,

A consistent analysis of met-effects on daily PM2.5 will benefit from and may require the presence of all PM2.5 and meteorological data for each daily record used in the analysis. If any values are missing, the entire day might be excluded from further consideration. Therefore, data completeness is very desirable for the analysis to be as meaningful as possible. To minimize instances of missing PM2.5 and meteorological

data, imputed values were calculated based on relationships for measured data at sites nearby. The imputed values were used when appropriate. Details concerning the imputation method (called "I-Bot") are available from the Air Quality and Statistical Studies Section of the ARB.

2. Analytical method: Classification and Regression Trees

Classification and Regression Trees (CART) is a statistical exploratory technique for uncovering structures in the data, which is sometimes called "data mining" [Breiman et al., 1984; Thompson et al., 2001; Slini, et al., 2007]. CART is a non-parametric decision tree learning technique that produces a classification tree if the dependent (target) variable is categorical or a regression tree if the dependent variable is numeric. At each step of the tree building process, CART finds the best possible independent variable (or linear combination of independent variables) to split the values of the target variable into two groups for which the means are as different as possible (subject to certain constraints). Each of the new groups is called a "child" node. The process of node splitting is repeated for each child node and continued recursively until a stopping criterion is satisfied and a set of terminal nodes is reached [Breiman et al., 1984; Xu et al., 2005]. In this way, the nodes of the final CART tree explain the values of the dependent variable in terms of the independent variables used to make splits.

In this analysis of PM2.5 and meteorology, the final CART tree explains daily PM2.5 in terms of the meteorological variables (parameters) used to make the splits. Table 2 lists all the parameters used in this particular analysis. The parameters used are much the same as those listed in U.S. EPA Guidelines for Developing an Air Quality (Ozone and PM2.5) Forecasting Program [Dye et al., 2003].

Table 2. Meteorological parameters used in CART analysis

Target: Average PM2.5 Concentrations	
Predictor	**Type**
Season	Categorical
Weekday / Weekend	Categorical
Holiday or Not	Categorical
Temperature	Surface
Wind Speed	Surface
Relative Humidity	Surface
500 mbar Height	Upper Air
850 mbar Temperature	Upper Air
Difference between Surface and 850 mbar Temperature (Surrogate for Stability)	Derived
Difference of Maximum and Minimum Temperature (Diurnal Variability)	Derived

To prepare a CART tree, we selected the years 2004 – 2006 as base years, assuming that the relevant emissions did not change greatly during these few years. When emissions are reasonably stable, day-to-day differences in PM2.5 concentrations

are mostly due to differences in meteorology. We then applied CART analysis to the base years to define a relationship ("tree") between daily PM2.5 and daily meteorological conditions.

First, we forced the tree to be split by season so that an independent sub-tree was generated for each season. Each sub-tree consisted of one or more terminal nodes representing different meteorological classes. The CART system makes the differences in PM2.5 between the met-classes as large as possible and the differences in PM2.5 within the met-classes as small as possible. The PM2.5 concentration representing each met-class (terminal node) is the average concentration of all the days assigned to that met-class in the base years. For each day assigned to a met-class, the average PM2.5 for the met-class serves as a "predicted PM2.5" for that day. Days with high predicted values have met-conditions that are more conducive to PM2.5 formation compared to days with low predicted values.

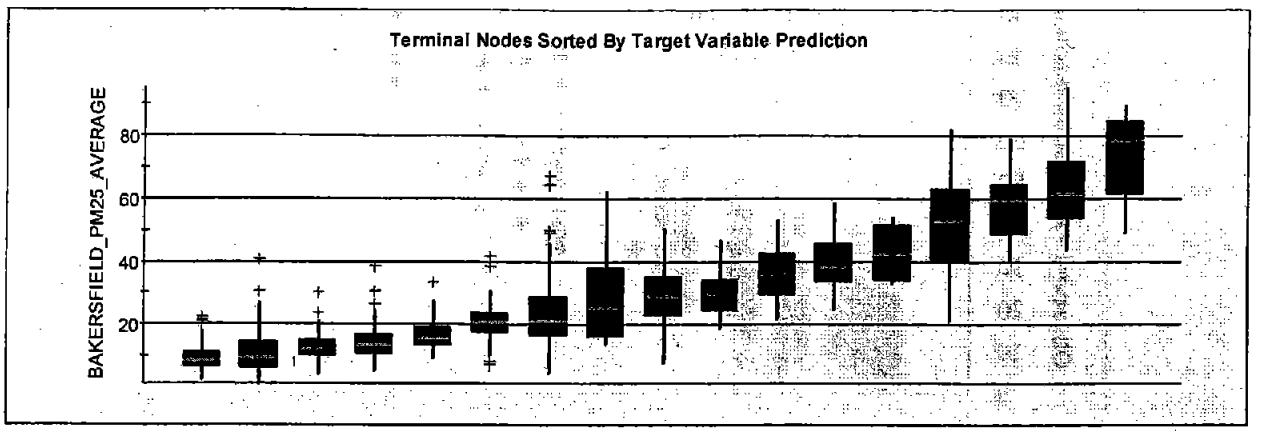
The CART-defined relationships between meteorology and PM2.5 in the base years were then used to assign days in the other years to their appropriate met-classes based on their day-specific meteorological data. The predicted PM2.5 values for all the days are then used to adjust PM2.5 trends up or down to compensate for each year's PM2.5-conduciveness relative to "normal".

3. Results and Discussion

Based on daily air quality and meteorological data in 2004-2006, a CART tree with 17 met-classes (terminal nodes) was constructed for the Bakersfield area (Figure 1a) and a CART tree with 22 met-classes was constructed for the Fresno area (Figure 1b). Figure 2 indicates that ~75 – 80 percent of the variation in daily PM2.5 during the base years is accounted for by each of the CART trees. Table 3 shows that three met-factors – wind speed, stability (difference surface 850mb temperatures), and minimum surface temperature – affected daily PM2.5 concentrations strongly in both Bakersfield and Fresno, while relative humidity (RH) was more important for PM2.5 production in the Bakersfield area than in the Fresno area. In general, high PM2.5 concentrations in the Bakersfield were associated with relatively high stability, low wind speed and high RH. In Fresno, high PM2.5 was generally associated with cold mornings (low minimum surface temperature), high stability, and low wind speed.

It is worth mentioning that this CART model treats each day independently and does not directly characterize met-conditions over a sequence of days that may result in long-term buildup and transport of PM2.5.

A sensitivity analysis was, also, done to explore the impact of the selected base years on the CART results for the Bakersfield area. For this purpose, different sets of base years (2003-2005, 2004-2006, and 2006-2008) were used with CART to develop relationships between meteorology and PM2.5. The met-adjusted annual average PM2.5 concentrations proved to be quite similar regardless of the base years used in the CART analysis.



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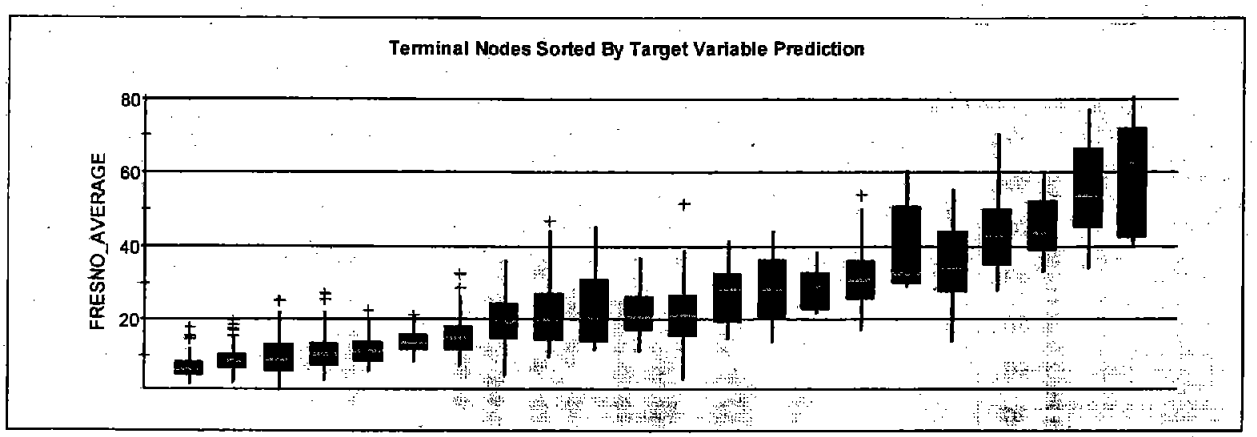

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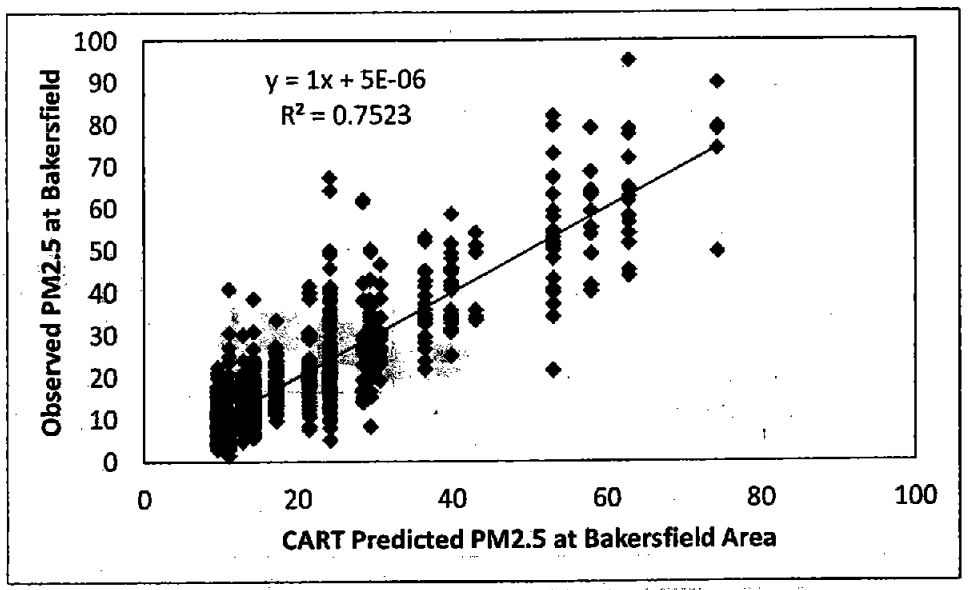
Figure 1. CART terminal nodes sorted by target variable predictions (PM2.5) in (a) Bakersfield area and (b) Fresno area.



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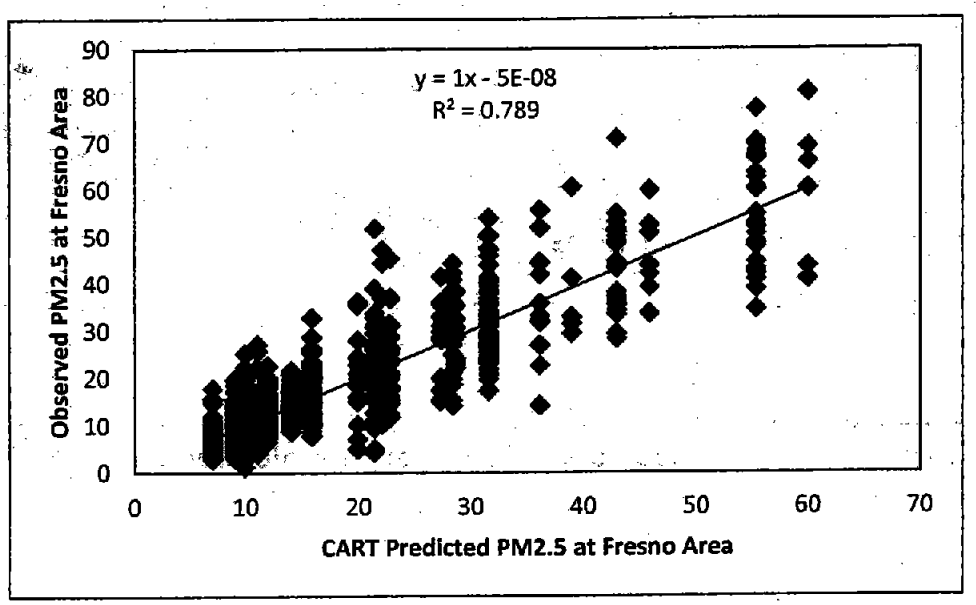


(b)

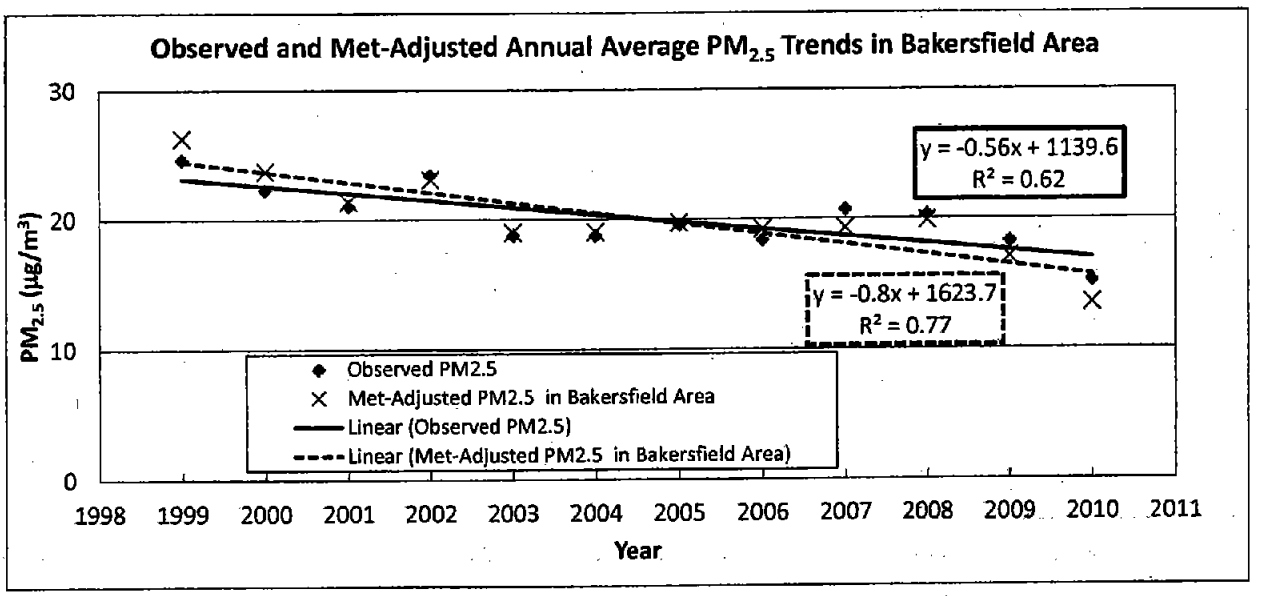
Figure 2. Observations vs. CART predictions during the base years in the (a) Bakersfield and (b) Fresno areas

Table 3. Relative importance of met-factors in forming the CART trees on a 0 to 100 scale.

Meteorological Factor	Variable Importance In Bakersfield	Variable Importance in Fresno
Average Wind Speed	100	100
Aveage Surface T - 850 mbar T	69.02	56.24
Minimum Surface Temperature	56.11	60.89
Season	52.52	51.48
Minium Surface T - 850 mbar T	47.74	36.37
Maximum Surface T - 850 mbar T	45.59	96.49
Average Relatively Humidity	40.12	10.11
Average Surface Temperature	39.84	59.65
Maximum Surface Temperature	28.51	37.02
Afternoon 850 mbar Temperature	26.4	6
Average 850 mbar Temperature	20.88	5.89
Average 500 mbar Height	12.42	22.91
Afternoon 500 mbar Height	12.14	7.07
Maximum Relative Humidity	10.45	9.67
Morning 850 mabr Temperature	6.01	5.85
Maximum Surfact T - Minimum Surface T	4.15	3.76
Minimum Relative Humidity	3.54	2.84
Morning 500 mbar Height	0.07	5.43

Annual average PM2.5 trends for observed data and for CART-predicted values (2004-2006 used as base years) were compared in the Bakersfield and Fresno areas. In both areas, observed PM2.5 levels decreased significantly from 1999 to 2003, were relatively flat from 2003 to 2008, then decreased in 2009 and 2010. CART-predicted trends represent meteorological conditions that affect PM2.5 concentrations. For the Bakersfield area, the CART-predicted trend indicates that met-conditions favored lower than normal PM2.5 in 1999 – 2000, normal PM2.5 from 2001 – 2006, and higher than normal PM2.5 from 2007 – 2010. The CART-predicted trend for the Fresno area indicates that met-conditions have been more stable and have had relatively small impacts on the observed PM2.5 trends from 1999 – 2010.

The CART-predicted trend information was merged with the observed trends to produce met-adjusted trends for annual average PM2.5. Figure 3 shows the observed and met-adjusted trends for (a) the Bakersfield area and (b) the Fresno area. Linear trend lines are shown for the observed and the met-adjusted trends in each area. Figure 3 indicates that the met-adjusted trend shows a greater decrease than the observed trend in the Bakersfield area, while the met-adjusted trend is similar to the observed trend in the Fresno area. In both areas, met-adjusted PM2.5 decreased by ~ 0.8 $\mu g/m^3$ per year from 1999 – 2010. Overall, the met-adjusted trends indicate that average PM2.5 decreased 40 – 50 percent in the Bakersfield and Fresno areas from 1999 – 2010 as a consequence of ongoing emission reductions.



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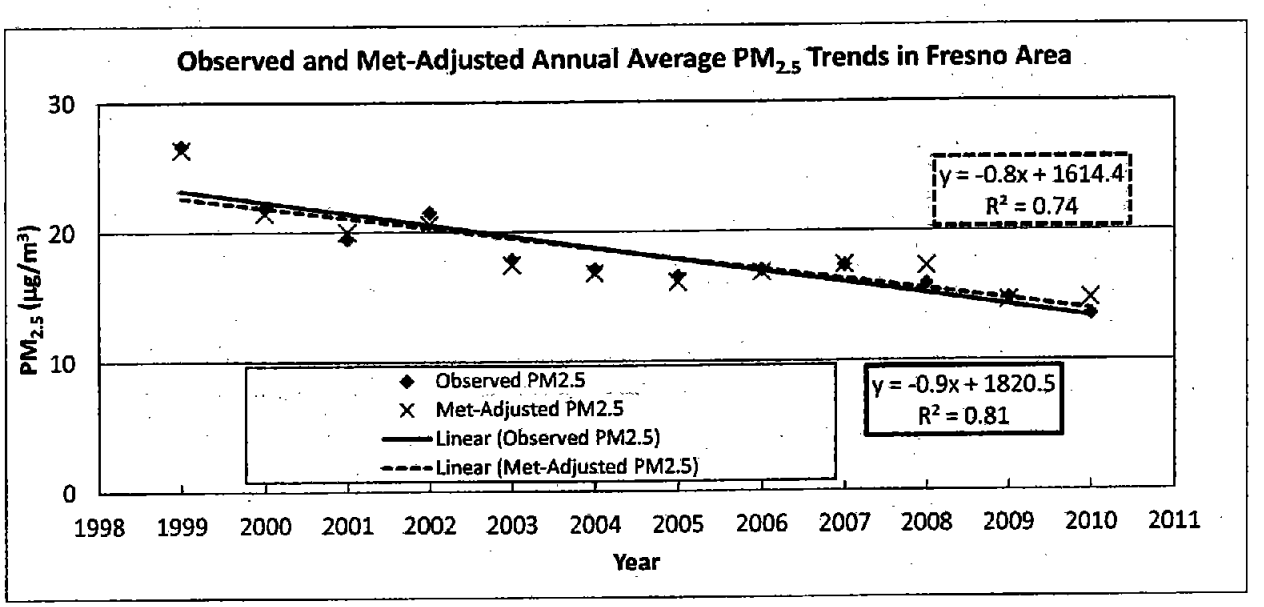


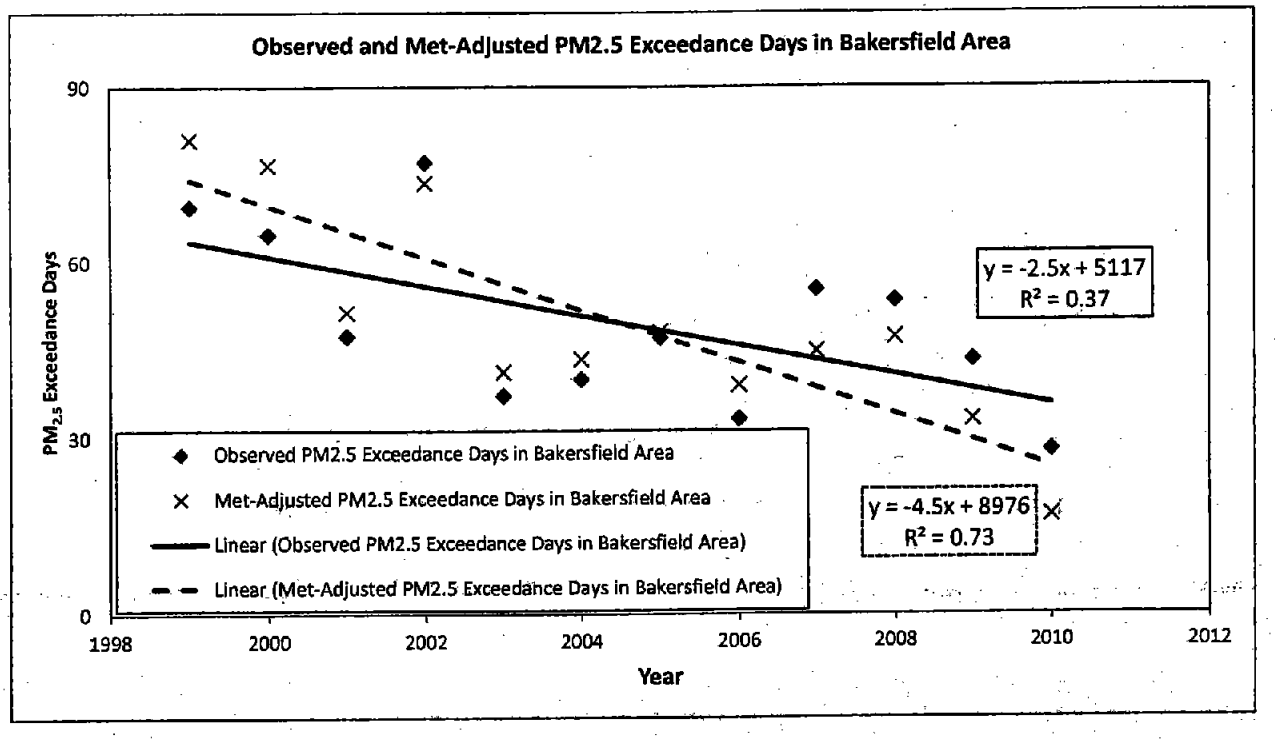
(b)

Figure 3. Trends of observed and meteorologically adjusted PM2.5 concentrations in (a) Bakersfield and (b) Fresno areas of the San Joaquin Valley

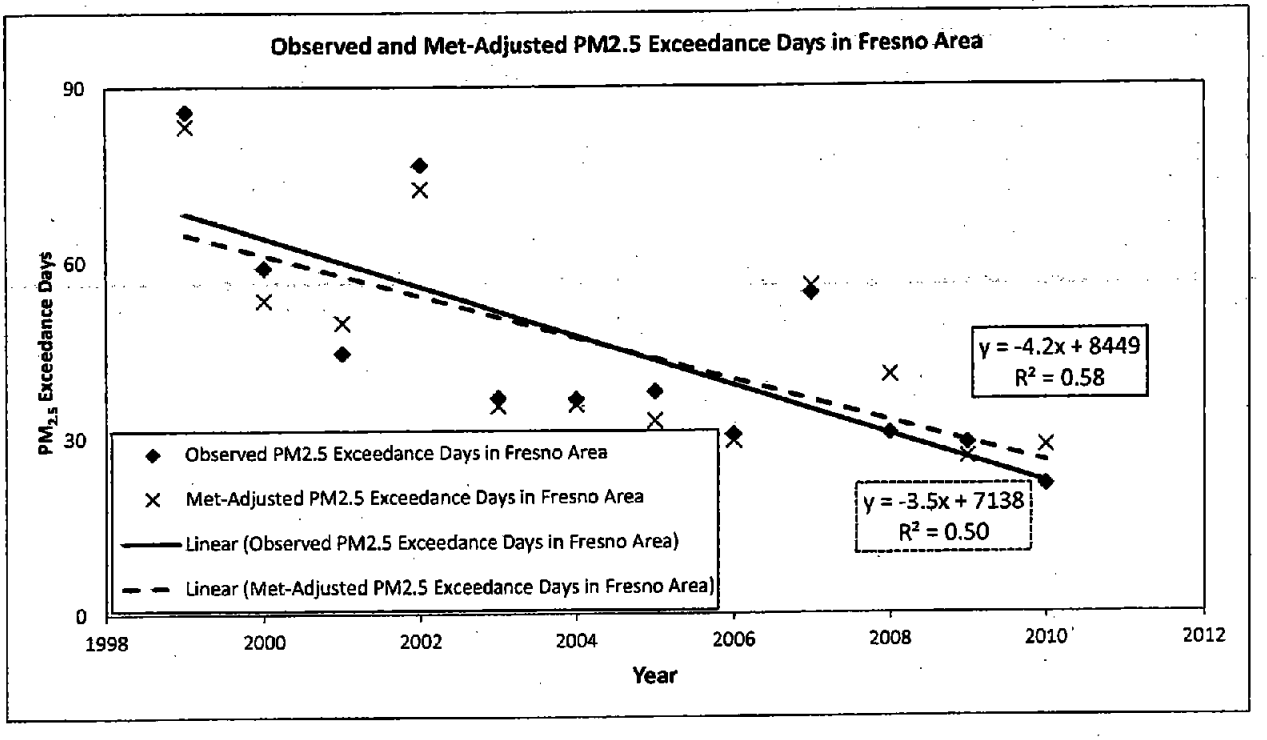
Trends for exceedance days were prepared for the Bakersfield and Fresno sub-regions. For this work, an exceedance day meant that the sub-regional average daily PM2.5 concentration was greater than or equal to 35 ug/m3. Trends for the observed PM2.5 data and for the CART-predicted PM2.5 data (representing meteorological effects) were prepared.

In the Bakersfield area, similar to the annual averages, the CART-predicted exceedance days increased from the earlier years to recent years, indicating an increase in meteorological conduciveness for PM2.5. In the Fresno area, the impact of meteorology on PM2.5 exceedance days was relatively small, again similar to the annual averages. In both areas, the observed PM2.5 exceedance days were greater than the CART-predicted PM2.5 exceedance days from 1999 through 2002. The two trends were similar from 2003 through 2008. Finally, for 2009 and 2010, observed PM2.5 exceedance days decreased significantly and dipped below the CART-predicted exceedance days. The implication of these results is that emission reductions played a significant role in decreasing the PM2.5 exceedance days from 1999 – 2010, especially in the Bakersfield area.

The CART-predicted trend information was merged with the observed trends to produce met-adjusted trends for PM2.5 exceedance days. Figure 4 shows that after adjusting for meteorology, PM2.5 exceedance days decreased about 60 – 70 percent from 1999 to 2010, with decreases of ~ 3.5 days per year in the Fresno area and ~ 4.5 days per year in the Bakersfield area.



(a)



(b)

Figure 4. Trends of observed and meteorologically adjusted PM2.5 exceedance days in (a) the Bakersfield area and (b) the Fresno area.

4. Summary

Overall, CART analysis can help us to define the relationship between PM2.5 mass concentrations and meteorological conditions and to calculate meteorologically adjusted trends. Such trends can help reveal the impact of emission changes on air pollutant levels, and promote the development of effective air pollution control strategies and regulations. Of course, as with any statistical analysis, there are uncertainties and limitations in CART analysis. Therefore, caution is needed when interpreting the resulting air quality trends, especially when small differences occur within short time periods.

The annual average PM2.5 concentrations and the number of exceedances of the 24-hour PM2.5 standard followed similar trends in the Bakersfield and Fresno areas from 1999-2010. In the Fresno area, the meteorological conditions seem to have been relatively stable, so met-adjusted trends were similar to the observed trends. In the Bakersfield area, however, meteorological conditions were relatively less PM2.5 conducive in the earlier years (i.e. 1999-2000) and more conducive in recent years (i.e. 2007-2010), with more normal years in between. Accordingly, the met-adjusted trends for the Bakersfield area show a greater decrease in PM2.5 levels compared to the observed trends.

Based on the differences between the predicted PM2.5 levels under the observed meteorological conditions and under "normal" meteorological conditions, the PM2.5 observations are adjusted to derive met-adjusted PM2.5 trends. The analyses indicate that the met-adjusted annual average PM2.5 concentrations decreased at a rate of ~0.8 $\mu g/m^3$ per year between 1999 and 2010 for a total of ~40-50 percent decrease in met-adjusted PM2.5 in the Bakersfield and Fresno areas as a result of emission reductions during this period. Met-adjusted trends for PM2.5 exceedance days indicate ~60-70 percent progress from 1999 – 2010, with decreases of ~ 3.5 days per year in the Fresno area and ~ 4.5 days per year in the Bakersfield area.

5. References

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Appendix C

Link to District 2012 PM2.5 Plan

www.valleyair.org/Air_Quality_Plans/PM25Plans2012.htm

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Appendix D

Link to U.S. EPA Approval of 2007 State Strategy

www.arb.ca.gov/planning/sip/sjvpm25/Final_FR_2008_SJV_PM25.pdf

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER APPROVAL OF THE SOUTH COAST AIR BASIN 2012 PM2.5 AND OZONE STATE IMPLEMENTATION PLANS

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider approval of the proposed South Coast 2012 Air Quality Management Plan (2012 AQMP) that includes State Implementation Plans (SIP) amendments for 24-hour fine particulate matter (PM2.5) and 1-hour ozone. The amendments also include transportation budgets, section 182(d)(1)(A) vehicle miles traveled (VMT) offset demonstrations, and actions to make further progress on fulfilling the approved commitments for emission reductions from advanced technology under section 182(e)(5) of the federal Clean Air Act (CAA).

The 2012 AQMP was developed and approved by the South Coast Air Quality Management District (AQMD or District). If approved, ARB will submit the SIP revision to the United States Environmental Protection Agency (U.S. EPA) for approval as a revision to the California State Implementation Plan (SIP).

DATE: January 25, 2013

TIME: 9:00 a.m.

PLACE: South Coast Air Quality Management Auditorium
21865 Copley Drive
Diamond Bar, California 91765

This item will be considered at a one-day meeting of the Board in Diamond Bar, which will commence at 9:00 a.m., January 25, 2013. Please consult the agenda for the meeting, which will be available at least ten (10) days before January 25, 2013, to determine the schedule on which this item will be considered.

The CAA establishes planning requirements for areas that exceed the health-based National Ambient Air Quality Standards (standard). These nonattainment areas must develop and implement a SIP that demonstrates they will attain the standard by specified dates mandated by the CAA.

In December 2006, U.S. EPA lowered the 24-hour standard for PM2.5 from 65 ug/m^3 to 35 ug/m^3. Effective December 14, 2009, U.S. EPA designated the South Coast Air Basin as nonattainment for this more stringent 24-hour PM2.5 standard. The District must develop and implement a plan that addresses the federal requirement to attain the standard as expeditiously as practicable, but no later than December 2014. The District prepared the 24-hour PM2.5 plan as part of the 2012 AQMP to address this requirement. On December 7, 2012, the AQMD Governing Board adopted the 2012 AQMP including the 24-hour PM2.5 plan.

On November 6, 1991, U.S. EPA designated the South Coast Air Basin an extreme nonattainment area for the 1-hour ozone standard with an attainment date of no later than November 15, 2010. To fulfill CAA section 182 requirements demonstrating attainment, ARB submitted to U.S. EPA the 1997/1999 revision to the South Coast 1-hour ozone SIP. U.S. EPA approved this plan in 2000. In 2003, ARB submitted a revision to the earlier 1997/1999 plan. The attainment demonstration in the revision was ultimately disapproved by U.S. EPA in 2009 when it concluded that the 2003 South Coast 1-hour ozone SIP did not meet the CAA section 182(c)(2)(A) requirement for a 1-hour ozone attainment demonstration by the applicable attainment date.

Shortly after U.S. EPA disapproved the attainment demonstration in the 2003 SIP, several environmental and community groups filed a petition for review in the U.S. Court of Appeals for the Ninth Circuit challenging U.S. EPA's 2009 actions on the 2003 South Coast 1-hour ozone SIP. Among other issues, the case centered on the consequences of U.S. EPA's final disapproval of the attainment demonstration. On February 2, 2011, the Ninth Circuit ruled in favor of the petitioners, regarding the consequences of failing to demonstrate attainment by the attainment date, and remanded EPA's 2009 final action on the 2003 South Coast 1-hour ozone SIP.

On September 19, 2012, U.S. EPA published a proposed rule in response to the remand by the Ninth Circuit Court of Appeals to find that the South Coast Air Basin has not complied with the obligation to adopt and implement a plan providing for attainment of the 1-hour ozone standard. As a result, U.S. EPA has proposed a SIP call that will require the District to submit a new SIP showing attainment of the 1-hour ozone standard by the end of 2022.

Therefore, as part of the 2012 AQMP, the District is submitting a 1-hour ozone plan demonstrating attainment of the 1-hour ozone standard as expeditiously as practicable, but no later than 2022. The AQMD Governing Board adopted the 2012 AQMP including the 1-hour ozone plan on December 7, 2012.

Attainment demonstrations for these two standards rely on implementation of the State's existing control program plus new control measures to provide emission reductions by the attainment deadlines. The District's new PM2.5 measures include further strengthening of their wood burning curtailment program, outreach, and incentive programs. The 1-hour ozone attainment demonstration relies on the continued implementation of the 2007 8-hour ozone SIP. The approved 2007 ozone SIP includes a commitment to reduce emissions by 2022 and 2023, to meet 8-hour attainment requirements. The 1-hour attainment demonstration relies on the same commitment and quantifies the reductions for 2022.

Lastly, when U.S. EPA approved the 2007 ozone SIP, it approved a commitment to achieve additional reductions from advanced technology as provided for by section 182(e)(5). The AQMP identifies a number of actions to develop and put into use advanced transformational technologies to fulfill in part this commitment for CAA section 182(e)(5) reductions.

ARB staff has reviewed the 2012 AQMP and has concluded that it meets the applicable CAA requirements. ARB staff is recommending that the Board approve the 2012 AQMP and direct staff to submit the 24-hour PM2.5 plan, the 1-hour ozone plan, the transportation budgets for the 24-hour PM2.5 plan, and the VMT offset demonstrations for both the 1-hour ozone plan and the 2007 8-hour ozone plan to U.S. EPA as a revision to the California SIP.

A written ARB staff report describing the SIP commitments included in the 2012 AQMP will be available prior to the meeting. Copies of the report may be obtained from ARB's Public Information Office, 1001 I Street, First Floor, Environmental Services Center, Sacramento, California, 95814, (916) 322-2990. The report may also be obtained from ARB's website at: http://www.arb.ca.gov/planning/sip/sip.htm

Interested members of the public may present comments orally or in writing at the meeting and may be submitted by postal mail or by electronic submittal before the meeting. To be considered by the Board, written comments not physically submitted at the meeting must be received **no later than 12:00 noon, January 23, 2013,** 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

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and verbal comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the meeting so that ARB staff and Board members have additional time to consider each comment. Further inquiries regarding this matter should be directed to Mr. Ravi Ramalingam, Manager, Northern California SIP Section, Planning and Technical Support Division at (916) 322-2085 or Dr. Scott King, Staff Air Pollution Specialist, Northern California SIP Section, Planning and Technical Support Division at (916) 322-2832.

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia;
- Documentos disponibles en un formato alterno u otro idioma;
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: December 21, 2012

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 at www.arb.ca.gov.

Staff Report

on

Proposed Revisions to the PM2.5 and Ozone State Implementation Plans for the South Coast Air Basin

Release Date: January 11, 2013
Scheduled for Consideration: January 25, 2013

California Environmental Protection Agency

Air Resources Board

Electronic copies of this document can be found on ARB's website at http://www.arb.ca.gov/planning/sip/sip.htm. Alternatively, paper copies 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.

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.

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APPENDICES

Appendix A: SCAQMD Submittal Letter to ARB

Appendix B: SCAQMD 2012 Board Resolution

Appendix C: Link to South Coast 2012 AQMP

Appendix D: Link to U.S. EPA Approval and Promulgation of Implementation Plans; California; 2007 South Coast PM2.5 Plan and 2007 State Strategy

Appendix E: Link to U.S. EPA Approval of Air Quality Implementation Plans; California; South Coast; Attainment Plan for 1997 8-Hour Ozone Standards

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I. Introduction

The South Coast 2012 Air Quality Management Plan (AQMP) is a multi-pollutant strategy to improve the air quality in the South Coast. The 2012 AQMP amends the South Coast Air Quality Management District (District) State Implementation Plan (SIP) to address three health-based National Ambient Air Quality Standards (NAAQS or standards): the 24-hour PM2.5 standard, the 8-hour ozone standard, and the 1-hour ozone standard.

Specifically, the 2012 AQMP:

- Demonstrates attainment of the 24-hour PM2.5 standard of 35 micrograms per cubic meter (ug/m^3) by 2014.
- Identifies measures and actions to fulfill 8-hour ozone SIP commitments approved by U.S. EPA to achieve emission reductions from advanced technologies.
- Demonstrates attainment of the 1-hour ozone standard by 2022.

In 2011 and 2012, the U.S. Environmental Protection Agency (U.S. EPA) approved South Coast SIP amendments for the annual average PM2.5[1] and the 8-hour ozone[2] standards, respectively, see Appendices D and E. The attainment strategies were developed and adopted by the District and ARB and submitted to U.S. EPA in 2007 (2007 SIP). The approved strategies target NOx for ozone attainment, and NOx, SOx and direct PM2.5 for PM2.5 attainment.

The strategies in the 2007 SIP achieve most of the reductions necessary for the South Coast Air Basin to meet the 24-hour PM2.5 standard by the attainment year of 2014. To achieve the additional reductions needed for attainment, the District is proposing enhanced control measures to reduce emissions from wood burning and open burning on days when high PM2.5 levels are expected, in addition to reductions from char-broiler and livestock measures.

U.S. EPA has approved commitments by the District and ARB to adopt measures and achieve emission reductions needed for ozone attainment, including commitments to achieve emission reductions from advanced technologies as provided by Clean Air Act (CAA), section 182(e)(5). Technology has long been key to the State's air quality progress. The 2012 AQMP includes specific actions for the South Coast District and ARB to develop advanced technologies to achieve emission reductions through regulations, incentives, and other mechanisms to implement the federally approved commitments.

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[1] 76 FR 41562 (July 14, 2011)
[2] 77 FR 12674 (March 1, 2012)

The 2012 AQMP also includes a 1-hour ozone SIP revision with an attainment demonstration for 2022 that relies upon reductions from implementation of the 2007 8-hour ozone SIP, along with new District 8-hour ozone measures. The 1-hour ozone attainment demonstration in the 2012 AQMP includes emission reductions to be achieved through the same advanced technology measures and actions identified for the purposes of compliance with the 8-hour ozone standard.

Finally, the 2012 AQMP addresses other federal planning requirements including requirements for emissions inventories, contingency measures, transportation conformity budgets, VMT offset demonstrations, and Reasonably Available Control Measure analysis.

A. South Coast PM2.5 SIP

PM2.5 air quality in the South Coast air basin is steadily improving with attainment of both the annual and 24-hr PM2.5 standards projected by 2014. The SIP for the annual standard was approved by U.S. EPA in 2011. The 2012 AQMP includes the required attainment demonstration for the 24-hour PM2.5 standard of 35 ug/m^3.

The air quality trend from 2001 through 2011 shows sharp reductions in PM2.5 concentrations over that ten-year period. The three year averages or design values, dropped from 76 ug/m^3 to 38 ug/m^3. Without additional controls, the air quality modeling in the AQMP shows attainment by 2019. With the new SIP measures, the modeling projects that the 2014 design value will be 34.3 ug/m^3, advancing the attainment date from 2019 to 2014.

All of the sites in the South Coast with the exception of Mira Loma meet the 24-hour PM2.5 standard by 2014 with the current control program. The new measures are necessary to bring this last site into attainment by 2014. The PM2.5 attainment strategy is primarily focused on directly-emitted PM2.5 and NOx reductions that can be feasibility achieved by the attainment date of 2014.

The District's new PM2.5 control measures include stationary source controls, episodic controls, technology assessments, and educational programs. The key measures will reduce directly-emitted PM2.5 are:

- enhancing the residential wood burning curtailment program;
- enhancing open burning restrictions.

The air quality modeling done for the AQMP was performed according to U.S. EPA guidelines, producing the results needed to develop the attainment demonstration. The first modeling exercise demonstrated that the region would attain the standard by 2019 with implementation of current control programs. The next step was to focus on controls that would be most effective in reducing

PM2.5 to accelerate attainment. This effort involves determining the relative value of PM2.5 precursor reductions.

The modeling done for the federally approved South Coast SIP for the annual PM2.5 standard established a set of factors to relate regional precursor per ton reductions to PM2.5 air quality improvements. The modeling for the 2012 AQMP provided a similar set of factors. Directly emitted PM2.5 reductions were the most effective, about 15 times more effective than NOx. Reductions in SOx were about eight times more effective than NOx. The contribution of ammonia emissions is imbedded as a component of the SOx and NOx factors since ammonium nitrate and ammonium sulfate are the particles formed in the atmosphere and contribute to PM2.5 concentrations. The analysis showed that reductions in VOC are the least effective per ton reduction, about one-third the benefit of NOx reductions.

Further attainment modeling was done to project a 2014 future year design value based on adopted control measures that will be implemented by 2014. The result was a predicted design value of 37.3 ug/m^3 which fails to meet the federal standard. New SIP measures were then developed bringing the modeled design value for 2014 to below 35.4 ug/m^3 which meets the federal standard.

U.S. EPA's modeling guidance recommends the use of corroborating evidence to support the SIP attainment demonstration. The weight of evidence demonstration in the AQMP includes discussions of PM2.5 levels, emission trends, and future year PM2.5 predictions. The PM2.5 trend shows about a 50 percent decrease in PM2.5 concentrations between 2001 and 2011. The rate of improvement is just under four ug/m^3 per year. If that trend is extended beyond 2011, the projection suggests attainment in 2013. This is corroborative evidence to support the modeling projection of attainment by 2014.

The AQMP weight of evidence discussion also shows the relationship between reductions in emissions of PM2.5 and NOx, and the downward trend in PM2.5 concentrations. Between 2002 and 2008, NOx emissions declined 31 percent and directly emitted PM2.5 was reduced 19 percent. During this same timeframe, the 24-hour average PM2.5 concentrations declined 27 percent showing the effectiveness of current control strategies.

Since the attainment demonstration need only show an attainment year concentration below 35.4 ug/m^3, any measures leading to improvement in air quality beyond this level can serve to meet contingency measure requirements. The AQMP shows that with the new SIP measures, the 2014 design value is 34.28 ug/m^3 providing an excess air quality improvement of 1.2 ug/m^3 which can be used for contingency purposes.

The excess air quality improvements beyond those needed to demonstrate attainment are also expressed in terms of emission reductions. The AQMP

includes a calculation showing that a portion of the new PM2.5 and NOx reductions are reserved for contingency purposes.

B. South Coast Ozone SIP

Ozone air quality in the South Coast air basin is improving with attainment of both the 1-hour and 8-hour ozone standards projected by 2022 and 2023 respectively. The SIP for the 8-hour ozone standard was approved by U.S. EPA in 2011. While the 1-hour ozone standard was revoked once the more health protective 8-hour standard[3] was adopted, U.S. EPA recently took action to require the submittal of an attainment demonstration for the 1-hour ozone standard of 0.125 parts per million (ppm). The 2012 AQMP includes an attainment demonstration for the 1-hour ozone standard showing attainment by the deadline of 2022.

South Coast ozone air quality continues to improve, with the number of days exceeding ozone standards dramatically reduced in portions of the basin. The number of exceedances is lowest in the coastal areas, increasing towards the Riverside and San Bernardino valleys and adjacent mountain areas. The highest concentrations are also declining as emissions are reduced throughout the air basin. The central San Bernardino mountains recorded the greatest number of exceedances of ozone standards, with 8 days over the 1-hour standard and 84 days over the 8-hour standard. Peak 1-hour ozone concentrations are also much lower than a decade ago. The three-year average, or design value, used in 1-hour ozone attainment demonstration is 0.142 ppm for 2011 compared to a design value of 0.170 ppm in 2001.

The ozone portions of the 2012 AQMP share a common strategy to attain both the 1-hour and 8-hour ozone standards. The attainment deadlines are nearly aligned, with a 2022 deadline for the 1-hour standard and 2023 for the 8-hour standard. The amount of reductions needed is different, but substantial new emissions reductions are needed to meet both ozone standards in the same general timeframe.

As in previous AQMPs, the strategy to reduce ozone is a dual NOx/VOC approach. While the strategy is more heavily weighted toward reducing NOx emissions, continuing VOC reductions remain important. The emphasis on NOx reductions is two-fold, one, because the science shows that generally in the South Coast NOx reductions currently provide greater benefit to reducing ozone, and two, because NOx is also a precursor for PM2.5.

The ozone strategy in the 2012 AQMP includes near-term NOx and VOC measures that rely on currently available and feasible technologies. New District short-term measures in the AQMP include:

[3] 62 FR 38856

- VOC reductions from coatings, solvents, adhesives, lubricants and fugitive emissions;
- NOx reductions from RECLAIM facilities, commercial heating and biogas Flares.

However, reductions from existing District and ARB programs, including stringent controls on diesel engines, plus these new near-term measures, are not sufficient to bring the air basin into attainment for ozone standards. The necessary reductions beyond what the near-term measures will accomplish are large, 150 tons per day (tpd) of NOx for the 1-hour ozone attainment demonstration and 241 tpd of NOx for the 8-hour ozone attainment demonstration.

The control strategy to attain both the 1-hour ozone and 8-hour ozone standards includes the approved commitment to achieve emission reductions from advanced technologies approved in the 2007 SIP. Collaborative work by District and ARB staff, led to the inclusion in the 2012 AQMP of a number of actions intended to increase the penetration of zero-emission and near zero-emission technologies into a variety of applications including:

- Passenger cars, medium-duty and heavy-duty trucks
- Off-road equipment
- Freight and passenger locomotives
- Marine vessels
- Cargo handling equipment

Implementing these actions will take the combined efforts of the District, ARB, and U.S. EPA, in cooperation with many stakeholders including the ports and regulated industries. The availability of funds to support technology development, demonstration and pilot projects and larger-scale implementation will be critical to successful implementation of the identified actions.

During development of the AQMP, U.S. EPA commented that the State needs to provide periodic reports on the efforts to achieve emission reductions from advanced technologies relied upon under CAA section 182(e)(5). In its resolution adopting the 2012 AQMP, the District Board directed staff to work with ARB to provide annual reports to U.S. EPA describing progress towards meeting Section 182(e)(5) emission reduction commitments. ARB and District staff are collaborating on activities to research, develop, and deploy advanced technologies and will include the annual report in the joint staff work effort.

II. Implementing the 2007 SIP Strategy

The control strategy in the AQMP relies on reductions of NOx and VOC to meet the 1-hour and 8-hour ozone standards. PM2.5 pollution is more complex, requiring reductions in directly-emitted PM2.5 as well as the PM2.5 precursors

NOx, SOx, and VOC. Because mobile sources are the largest contributors to PM2.5 and ozone-forming emissions, reducing emissions from passenger vehicles, trucks, and a variety of off-road engines is key to attaining the PM2.5 and ozone standards. In developing the 2007 SIP for meeting the annual PM2.5 standard by 2014 and the 8-hour standard by 2023, the biggest challenge was cleaning up the existing fleets of diesel engines. The mobile source strategy includes two distinct components – more stringent standards for new engines, and cleaning up fleets through accelerated introduction of cleaner engines or by retrofitting existing engines. This core strategy is carried forward in the 2012 SIP.

Over the past five years, ARB adopted a number of regulations aimed at reducing emissions of diesel particulate matter and oxides of nitrogen from freight transport sources like heavy-duty diesel trucks, and off-road sources like large construction equipment. Phased implementation of these regulations will produce increasing emission reduction benefits over time, as the regulated fleets are retrofitted, and as older and dirtier portions of the fleets are replaced with newer and cleaner models at an accelerated pace.

ARB's longstanding programs to reduce emissions from passenger vehicles, along with the smog check program, provide continuing benefits needed for attainment of the 24-hour PM2.5 standard and both ozone standards. Implementation of the ARB 2007 State Strategy approved by U.S. EPA[4] is providing new reductions included in the AQMP. Since development of the 2007 State Strategy, the ARB measures listed in Table 1 have been adopted and improvements to California's smog check and vehicle retirement programs have been made.

Table 1:
Measures in the 2007 State Strategy

Passenger Vehicles
Smog Check Improvements
Expanded Vehicle Retirement (AB 118)
Modifications to Reformulated Gasoline Program
Trucks
Cleaner In-Use Heavy-Duty Trucks
Goods Movement Sources
Auxiliary Ship Engine Cold Ironing & Other Clean Tech
Cleaner Main Ship Engines and Fuel

[4] 76 FR 41562 (July 14, 2011)

Port Truck Modernization
Accelerated Intro. of Cleaner Line Haul Locomotives
Clean Up Existing Harbor Craft
Off-Road Equipment
Cleaner In-Use Off-Road Equipment
Other Off-Road Sources
Enhanced Vapor Recovery for Above-Ground Storage Tanks
Additional Evaporative Emission Standards
Areawide Sources
Consumer Products Program

A. Clean New and In-Use Heavy-Duty Trucks

The central element of ARB's 2007 State Strategy is increasingly stringent standards for new trucks as shown in the Table 2. New heavy-duty trucks sold since 2010 must emit 98 percent less NOx and PM2.5 than new trucks sold in 1986.

Table 2:
Phase-in of truck engine standards

Model Year	**Applicable Standard g/bhp-hr**	
	NOx	PM
1986 and older	10.7	0.60
1987-2006	From 6.0 to 2.0	From 0.6 to 0.10
2007-2009	1.1	0.01
2010	0.2	0.01

However, older, higher-emitting trucks with long service lives would stay on the road for many years to come. With attainment of the PM2.5 standards required soon after the cleanest trucks were introduced, the typically slow replacement of older trucks on the road with the latest models would not provide emission reduction benefits soon enough.

To address this, ARB developed the Cleaner In-use Heavy-duty Truck SIP measure. This measure leverages the benefits provided by new truck emission standards by accelerating introduction of the cleanest trucks. The Truck and Bus Regulation was adopted in December 2008, and amended in December 2010 to account for the reduced emissions resulting from the economic effects of the

recession. This rule represents a multi-year effort to turn over the legacy fleet of engines and replace them with the cleanest technology available.

Starting in 2012, the Truck and Bus Regulation phases in requirements so that by 2023 nearly all vehicles will meet 2010 model year engine emissions levels. The regulation applies to nearly all diesel fueled trucks and buses with a gross vehicle weight rating greater than 14,000 pounds that are privately or federally owned, including on-road and off-road yard goats, and privately and publicly owned school buses. Moreover, the regulation applies to any person, business, school district, or federal government agency that owns, operates, leases or rents affected vehicles. The regulation also establishes requirements for any in-state or out-of-state motor carrier, California-based broker, or any California resident who directs or dispatches vehicles subject to the regulation. Finally, California sellers of a vehicle subject to the regulation would have to disclose the regulation's potential applicability to buyers of the vehicles.

Figures 1 and 2 below portray reductions in NOx and PM2.5 emissions from in-use trucks within the South Coast, and show the benefits of ARB's mobile strategy.

Figure 1:
South Coast Heavy-duty Diesel Truck NOx Emissions

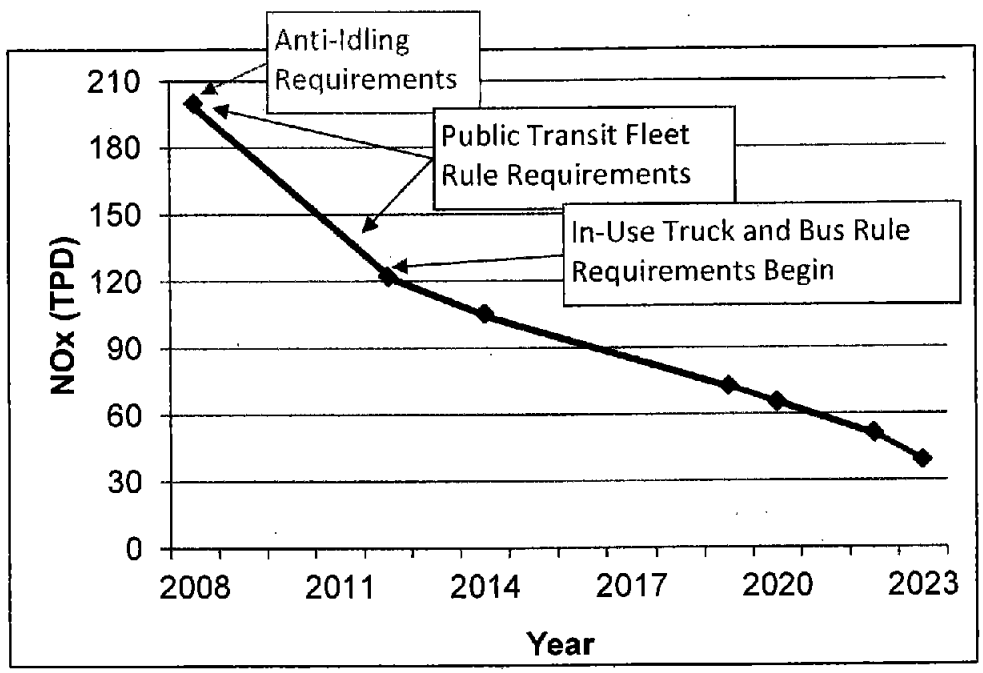
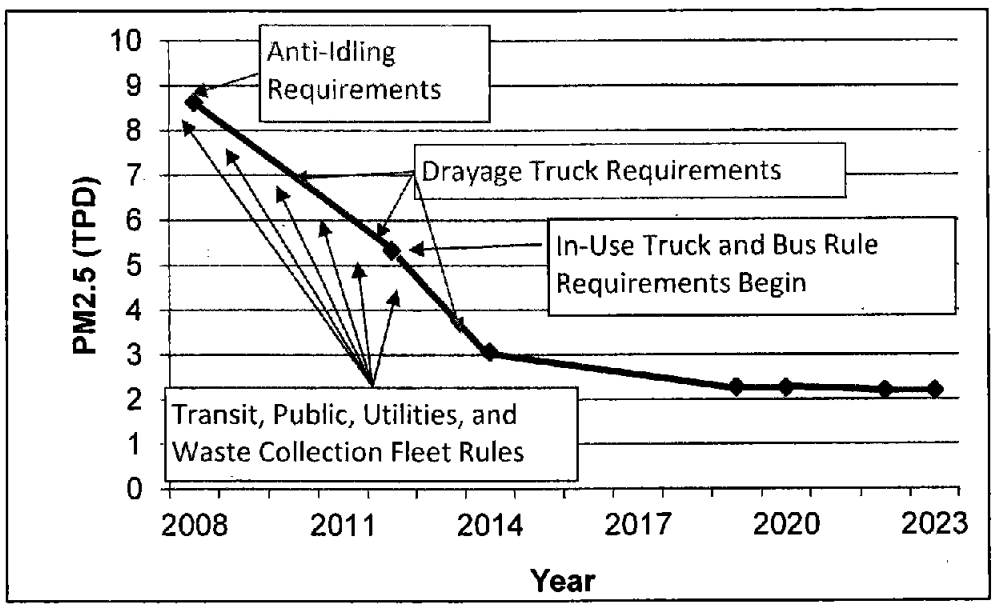


Figure 2:
South Coast Heavy-duty Diesel Truck PM2.5 Emissions



In addition to the Truck and Bus Regulation, separate regulations reduce emissions from other public fleets, solid waste collection trucks and transit buses. Trucks that transport marine containers must comply with the drayage truck regulation.

B. Cleaner In-Use Off-Road Equipment

As with trucks, the strategy for off-road equipment is based on increasingly stringent new off-road diesel engines. As a result of these standards for new engines, new construction, mining, industrial and oil drilling equipment will become progressively cleaner. The requirements vary according to the power rating of engines. Table 3 shows the schedule for phasing in tiered requirements for new off-road engines with a power rating between 175 and 300 horsepower (hp). Beginning in 2014, new Tier 4 construction equipment with the power rating shown below must emit about 96 percent less NOx and PM than new Tier 1 equipment sold in the year 2000.

Table 3:
Phase-in of off-road engine standards

Model year	Level of Control	Applicable Emission Standard for New Off-road Engines 175<hp<300 g/bhp-hr	
		NOx	PM
1996-2002	Tier 1	6.9	0.4
2003-2005	Tier 2	4.9*	0.15
2006-2010	Tier 3	3.0*	0.15
2011-2013	Tier 4 interim	1.5	0.015
2014+	Tier 4 final	0.3	0.015

*Reflects combined limit for non-methane hydrocarbons and NOx

However, large diesel off-road equipment typically remains in use for long periods of time. As with heavy-duty trucks, this long life means that newer, lower-emitting engines would be introduced into fleets relatively slowly. The impact of this is that emission reductions and associated health benefits from these cleaner engines would also be fairly slow to materialize. To address this, the 2007 SIP included the Cleaner In-use Off-road Equipment measure.

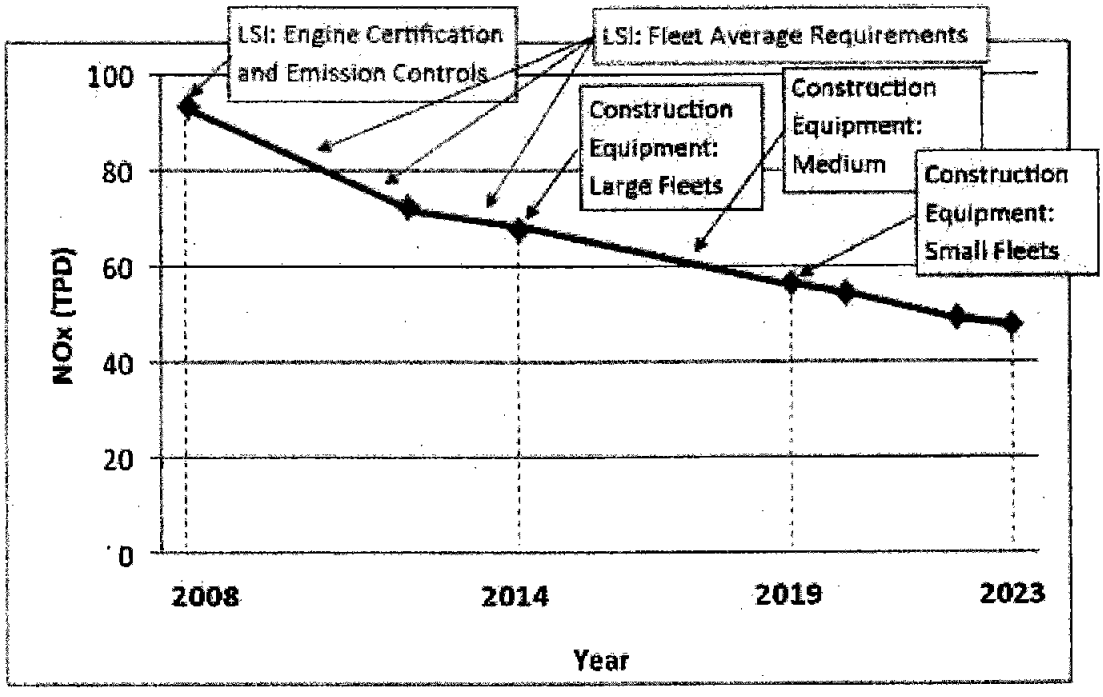
First approved in 2007, the Off-Road Regulation was amended in 2010 in light of the impacts of the economic recession. Affected off-road equipment is used in construction, manufacturing, the rental industry, road maintenance, airport ground support and landscaping. In December 2011, the Off-Road Regulation was modified to include on-road trucks with two diesel engines.

The Off-Road Regulation will significantly reduce emissions of diesel PM and NOx from the over 150,000 in-use off-road diesel vehicles that operate in California by requiring their owners to modernize their fleets and install exhaust retrofits. The regulation affects dozens of vehicle types used in thousands of fleets by requiring owners to modernize their fleets by replacing older engines or vehicles with newer, cleaner models, retiring older vehicles or using them less often, or by applying retrofit exhaust controls.

The Off-Road Regulation imposes idling limits on off-road diesel vehicles, requires a written idling policy, and requires a disclosure when selling vehicles. The regulation also requires that all vehicles be reported to ARB and labeled, restricts the addition of older vehicles into fleets, and requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing verified exhaust retrofits. The requirements and compliance dates of the Off-Road Regulation vary by fleet size.

Figure 3 below portrays reductions in NOx emissions from off-road equipment within the South Coast, and shows the benefits of ARB's mobile strategy.

Figure 3:
South Coast Off-Road Equipment NOx Emissions



C. Passenger Cars

The Board established California's Low Emission Vehicle (LEV) program in 1990, and the LEV2 program in 1998. Additionally, ARB's Zero Emission Vehicle (ZEV) regulation which affects passenger cars and light-duty trucks, has spurred movement towards commercialization of advanced clean cars and light-duty trucks. As a result, many new gasoline engines now emit at extremely low emission levels of smog forming emissions. Conventional hybrid electric vehicles have been commercialized, and the number of models offered for sale is quickly expanding. Recently, battery electric vehicles and plug-in hybrid electric vehicles have been introduced for sale, and fuel cell electric vehicles are expected to follow.

ARB's Advanced Clean Cars (ACC) Program, approved in January 2012, is a pioneering approach of a 'package' of regulations, that although separate in construction, are related in terms of the synergy developed to address both ambient air quality needs and climate change. The ACC program combines the control of smog, soot causing pollutants and greenhouse gas emissions into a single coordinated package of requirements for model years 2015 through 2025. The program assures the development of environmentally superior cars that will continue to deliver the performance, utility, and safety vehicle owners have come to expect.

The ACC program approved by ARB in January 2012 included amendments affecting the current ZEV regulation through the 2017 model year in order to enable manufacturers to successfully meet 2018 and subsequent model year requirements. The ZEV amendments for 2018 and subsequent model years in the ACC program approved by ARB in January 2012 are intended to achieve commercialization through simplifying the regulation and pushing technology to higher volume production in order to achieve cost reductions.

The ACC Program will produce increasing benefits over time as new cleaner cars enter the fleet displacing older and dirtier vehicles. In this manner, the benefits in 2023 will be realized through the cumulative reduction in emissions achieved by new cars entering the fleet in 2017 through 2023. This program will continue to provide benefits well after 2025 as vehicles meeting the new standards replace older, higher-emitting vehicles.

Many additional programs are currently in place to reduce emissions from the passenger car legacy fleets and accelerate fleet turn over. The Smog Check Program ensures that passenger vehicles stay clean as they age and on-board diagnostic systems identify smog control problems. The Smog Check Program is continuously being improved to provide additional emission reductions such as requiring stricter inspection standards and annual inspection of older vehicles. ARB is also active in encouraging consumers with older dirtier vehicles to retire them early. Replacing older dirtier vehicles with cleaner new vehicles provides permanent emission reductions.

D. Reducing Emissions from Ocean-going Vessels

Emissions from ocean-going vessels (OGV) impact coastal areas, especially densely populated regions hosting ports for international trade. The 2007 SIP relied on a suite of state, local, national, and international programs to reduce OGV emissions, which are summarized below.

The two major regulations adopted by ARB to reduce emissions from OGVs address shorepower and cleaner fuels. In December 2007, the Board adopted the OGV Shorepower Regulation. This rule reduces emissions from diesel auxiliary engines on container ships, passenger ships, and refrigerated-cargo ships while berthing at a California port.

In 2008, the Board adopted a comprehensive OGV Clean Fuel Regulation which requires vessel operators to use cleaner distillate fuels in their main engines, auxiliary engines, and auxiliary boilers within 24 nautical miles (nm) of the California coastline and islands. The regulation also includes a "Phase II" fuel standard requiring the use of 0.1 percent sulfur fuel in 2014. The use of these cleaner fuels is resulting in dramatic reductions in diesel PM and SOx emissions, as well modest reductions in NOx emissions.

Port authorities in California have also developed a number of measures for OGVs visiting their ports, which are typically implemented through incentive programs or lease agreements. The Ports of Los Angeles and Long Beach (Ports) have the most comprehensive program. In 2006, the Ports adopted the San Pedro Bay Ports Clean Air Action Plan, designed to reduce the emissions from a variety of port sources, including OGVs. The plan was updated in 2010. Currently, the Ports are working on developing the infrastructure and lease agreements to support the statewide shorepower regulation, implementing voluntary vessel speed reduction, and supporting the demonstration and deployment of advanced OGV emission control technologies. While the Ports handle most of the local programs for OGVs, the District also has rules to control VOC emissions from tankers during loading and lightering operations.

The 2007 SIP includes, as part of the U.S. EPA approved annual PM2.5 and 8 hour SIPs, a "backstop" measure for sources of pollutants at the ports, MOB-03. That measure is to be implemented through district rulemaking, which would include the setting of appropriate emissions targets that would trigger implementation were those targets to be exceeded. No District rulemaking or further SIP revisions happened between 2007 and 2012 to implement MOB-03 for either the PM annual or 8-hour standards.

In the 2012 SIP, the District proposed to include a backstop measure, IND-01, that would ensure that emissions targets assumed for port-related sources, intended to help attain and maintain the 24-hour PM2.5 standard, are actually achieved. Responding to concerns raised during the public AQMP development process and testimony at its December 7, 2012, meeting, the District Board did not include the proposed measure in the SIP revision. It directed the issue to an existing committee of the District Board that deals with port-related issues. As a result, there is currently no inclusion of the port backstop measure at this time for the 24-hour PM2.5 SIP. The District Board is considering the adoption of IND-01 at its February meeting, and if the District Board decides to include measure IND-01 in the 24-hour PM2.5 SIP, it would be forwarded to CARB at a later date for inclusion in the SIP.

III. Control Strategy and Attainment Demonstrations

The control strategies and SIP measures in the 2007 SIP are carried forward in the 2012 AQMP, and included in the attainment demonstrations for the 24-hour PM2.5 standard and the 1-hour ozone standard. In addition to the 2007 SIP measures, the AQMP includes several new District control measures needed for attainment of the PM2.5 standard by 2014, and to make progress on the meeting the 1-hour and 8-hour ozone standards.

A. 2007 SIP Emission Reduction Commitments

The control strategy to attain the 24-hour PM2.5 standard in 2014 and the 1-hour ozone standard in 2022 rely on the U.S. EPA approved commitments for emission reductions made by ARB for sources under its regulatory authority.

U.S. EPA acknowledged in the Federal Register Notice approving the South Coast 8-hour ozone SIP that ARB made enforceable commitments to achieve aggregate emissions reductions in the South Coast for the years of 2014, 2020 and 2023. Table 4 taken from the Federal Register shows the ARB commitment reductions in those years.[5]

Table 4:
Emission Reductions (TPD) in 2014, 2020 and 2023

Year	NOx	VOC
2014	152	46
2020	144	52
2023	141	54
2023 CAA 182(e)(5)	241	40

While the 2007 SIP strategy included estimates of the emission reductions from each of the individual new measures, the commitment in the 2007 SIP was to achieve the aggregate emission reductions identified from the existing strategy and adopted SIP. Therefore, if a particular measure does not get its expected emission reductions, the State is still committed to achieving the total aggregate emission reductions, whether this is realized through additional reductions from the new measures, or from alternative control measures or incentive programs. If actual emission decreases occur that exceed the projections reflected in the emission inventories and the 2007 SIP, the actual emission decreases may be counted toward meeting ARB's total emission reduction commitments.

In the 2012 AQMP, the District quantified reductions for 1-hour ozone attainment in 2022 from measures included in the 2007 SIP. The District calculated reductions from seven of these approved control measures (four on-road mobile source measures and three off-road measures) carried forward from the 2007 8-hour ozone SIP. The expected benefits from these seven measures in 2022 were calculated by interpolating between their expected reductions in 2020 and 2023. The quantified reductions from these measures are part of the already approved commitment for aggregate emission reductions in 2020 (see table 4) two years prior to 2022 attainment deadline. The commitment to achieve aggregate reductions is consistent with the 2007 SIP adopted in September 2007 and revised in April 2009[5]. While expected reductions were calculated for each measure, the enforceable commitment is for the aggregate reductions,

[5] 77 FR 12674 at 12692 (March 1, 2012)

recognizing the reality that individual measures may result in more or less reductions than expected.

The 182(e)(5) advanced technology actions identified for the 1-hour ozone attainment demonstration are also proposed in the AQMP to advance commitments made in the 2007 8-hour ozone SIP.

B. Attainment Demonstrations for PM2.5 and Ozone

The 2012 AQMP demonstrates attainment of the 24-hour PM2.5 standard by 2014 and the 1-hour ozone standard by 2022, the applicable deadlines for each pollutant. The 2012 AQMP attainment demonstrations for both the 24-hour PM2.5 and 1-hour ozone were conducted using photochemical dispersion and meteorological modeling tools and procedures developed according to U.S. EPA modeling guidelines. Air quality modeling is used to establish a "carrying capacity" – a combination of precursor emissions that the air basin can accommodate without exceeding the health-based standard – thus setting targets that the control strategy must meet to attain the federal standards.

The air quality modeling performed for the 2012 AQMP has undergone scientific peer review and was made available for public review. ARB and South Coast District staffs worked together on the modeling for this plan, including development of a gridded modeling inventory and meteorological and geological data inputs, model performance analysis, and validation of the attainment demonstrations.

U.S. EPA's PM2.5 modeling guidance recommends the use of corroborating evidence to support the future year attainment demonstration. The weight of evidence demonstration for the 2012 AQMP includes brief discussions of the observed 24-hour PM2.5 levels, emissions trends, and future year PM2.5 predictions. The weight of evidence discussion in Chapter 5 of the 2012 AQMP focuses on the trends of 24-hour PM2.5 and key precursor emissions to provide justification and confidence that the Basin will meet the federal standard by 2014.

No specific modeling guidance applies to the 1-hour ozone analysis since the standard has been revoked. The 1-hour ozone attainment demonstration is based on the deterministic modeling approach to directly predict future year concentrations. The alternate relative reduction factor approach, applied using a stratified or tiered approach to develop station specific projections of 2022 1-hr ozone concentrations, is used as part of the weight of evidence discussion in Section 5 of Appendix VII of the 2012 AQMP.

C. Actions to Achieve Reductions from Advanced Technologies

The 2007 SIP included a commitment to achieve reductions form the use of advanced zero and near-zero emission technologies in the on-road and off-road

fleets to meet emission reductions needed for the federal ozone standard in 2023. This provision of the Act, section 182(e)(5), reflects the need for new development and deployment of new technologies in regions with the most severity ozone air quality problems.

The CAA section 182(e)(5) provision is available to areas classified as extreme, if feasible technology does not exist for areas to meet the ozone standard by the applicable deadline. In its approval of the South Coast 2007 8-hour ozone SIP, U.S. EPA stated that:

> *"EPA interprets this provision to mean that the measures approved under section 182(e)(5) may include those that anticipate future technological developments as well as those that require complex analyses, decision making and coordination among a number of government agencies."* [6]

The 2012 AQMP identifies actions to reduce mobile source emissions through programs to accelerate the penetration and deployment of partial zero-emission and zero-emission vehicles and to accelerate retirement of older gasoline and diesel powered vehicles. The 2012 AQMP also lays out actions for the deployment of zero and near-zero technologies for goods movement related sources, including on- and off-road vehicles and equipment, locomotives, cargo handling equipment, commercial harbor craft, OGVs, and aircraft engines. The actions implement and do not amend the existing U.S. EPA approved SIP commitment.

Specifically, these actions include:

- accelerating the penetration of on-road partial zero-emission and zero-emission light and heavy-duty electric, hybrid and other clean alternative fuel vehicles;
- accelerating the retirement of older light, medium, and heavy-duty vehicles through financial incentives;
- repowering or replacing older Tier 0 and Tier 1 off-road equipment;
- targeting emission reductions from heavy-duty vehicles serving near-dock railyards;
- reducing emissions from locomotives by accelerated use of Tier 4 locomotives for freight, the replacement of existing Tier 0 passenger locomotives with Tier 4 locomotives, and the development and deployment of zero-emission and near-zero emission technologies for locomotives;
- reducing emissions from ships, by reducing emissions from ocean-going marine vessels while at berth, initiating an incentives program for cleaner ocean-going vessels to call at the ports, demonstrating control technologies that could be deployed on commercial harbor craft, and

[6] 77 FR 12674 at 12686 (March 1, 2012)

demonstrating control technologies to further reduce emissions from ocean-going vessels;
- advancing the development and deployment of zero- and near-zero emission technologies for cargo handling equipment;
- advancing the development of retrofit technologies to further reduce emissions from older off-road equipment; and
- developing cleaner aircraft engines through the Federal Aviation Administration's Continuous Lower Energy, Emissions and Noise Program, and mechanisms to route the cleanest aircraft to serve the South Coast Air Basin.

D. Consumer Products

Under State law, ARB has regulatory responsibility for reducing VOC emissions from consumer products. Currently, ARB's Consumer Products Regulation exempts low vapor pressure (LVP) substances when determining compliance with VOC limits. During AQMP development, the District considered a measure proposing that research be done to determine if the exemption should be modified. This proposal was based on testing conducted by the District indicating that some LVP-VOCs may readily evaporate and available to participate in ozone or organic aerosol formation.

At its December 7, 2012, meeting, the District Board removed the proposed measure regarding LVP research from the AQMP. Instead, the District Board directed District staff to request that ARB undertake research to determine whether some of the exempt substances contribute to ozone and should be further controlled for ozone attainment. ARB staff has already begun to design a research effort. Potential research tasks include laboratory chamber studies to further evaluate ozone and aerosol impacts, quantification of volatilization rates under ambient conditions, and evaluation of the environmental fate of LVP-VOCs emissions.

IV. Other Clean Air Act Planning Requirements

In addition to the core requirement for a control strategy and an attainment demonstration, the CAA specifies submittal of an emission inventory, contingency measures, transportation control conformity budgets, a VMT offset demonstration, and a Reasonably Available Control Measure (RACM) analysis.

A. Emission Inventory

An emission inventory consists of a systematic list of the sources of air pollutants with an estimate of amount of pollutants from each source or source category over a given period of time. The inventories used in the South Coast 2012 AQMP were developed using the most recent planning assumptions and the best

available technical information and meet the requirements of the Act following U.S. EPA guidance. The 2008 and 2014 baseline annual and summer inventories can be found in Chapter 3 of the South Coast 2012 AQMP. The 2022 baseline summer planning inventory can be found in Appendix VII of the South Coast 2012 AQMP.

ARB and District staff worked jointly over a two-year period to develop the emission inventory for the South Coast 2012 AQMP. This included efforts to ensure that the growth projections reflected the economic recession and the emissions reflected the unique nature of the 24-hour PM2.5 problem. The inventory includes updated growth profile data using sector specific forecasts, new methodologies and adopted rules, along with updated on-road mobile source activity from SCAG.

B. Contingency Measures

The Act requires that the SIP provide for contingency measures in the event of a failure to attain the 24-hour PM2.5 or the 1-hour ozone standard by the applicable attainment date. Additionally, extreme ozone nonattainment areas relying on CAA section 182(e)(5) provisions must provide contingency reductions should associated advanced technology reductions fail to materialize. These contingency measures must be already be adopted, take effect without further ARB or air district action, not be relied upon to demonstrate attainment for the time in which they serve as contingency measures, and should contain trigger mechanisms for implementation. U.S. EPA guidance states that the contingency measure requirements can be satisfied with an already adopted control measure provided those controls will achieve emission reductions above and beyond what is needed to demonstrate attainment.

The attainment contingency measure demonstration for the 24-hour PM2.5 standard is included in Chapter 6 of the 2012 AQMP and represents a sufficient margin of "about one year's of progress" and "generally linear" progress to satisfy federal contingency measure requirements. Control Measure CMB-01 Phase I seeks to achieve an additional two tons per day of NOx emissions reductions from the RECLAIM market if the 24-hour PM2.5 standard is not attained by 2014. The CMB-01 Phase I measure is scheduled for near-term adoption and includes the appropriate automatic trigger mechanism and implementation schedule consistent with CAA contingency measure requirements.

In order to rely on CAA section 182(e)(5), federal law requires that a State commit to submit no later than three years before the attainment deadline, SIP revisions containing contingency measures. The contingency measures are to be implemented should the anticipated technology measures approved under section 182(e)(5) not achieve the planned reductions. Under section 172(c)(9), the CAA also requires that a State commit to submit contingency measures three

years before the attainment deadline that would be triggered should the State fail to attain the standard on time.

As a result, in compliance with the CAA for the South Coast 8-hour SIP, ARB has made an enforceable commitment to submit, no later than 2020, contingency measures that meet the contingency requirements for both attainment and advanced technologies. For the 1-hour ozone standard with a 2022 attainment date, ARB will also submit the required contingency measures by the deadline of 2019.

C. Transportation Conformity Budgets

Under section 176(c) of the Act, transportation activities that receive federal funding or approval must be fully consistent with the SIP. U.S. EPA's transportation conformity rule details requirements for establishing motor vehicle emission budgets (budgets) in SIPs for the purpose of ensuring the conformity of transportation plans and programs with the SIP.

The 2012 AQMP establishes on-road motor vehicle emission budgets and a trading mechanism for the 24-hour PM2.5 standard. Emission budgets for direct PM2.5 and the PM2.5 precursors VOC and NOx, were calculated for the 2014 attainment year using EMFAC2011 and reflect annual average emissions. The emission budgets established in the 2012 AQMP fulfill the requirements of the Act and U.S. EPA regulations to ensure that transportation projects will not interfere with progress and attainment of the 24-hour PM2.5 standard. Additional detail on the on-road motor vehicle budgets can be found in chapter 6 of the 2012 AQMP.

D. Ozone VMT Offset Demonstration

The 2012 AQMP includes a VMT offset demonstration that fully addresses the CAA requirements under section 182(d)(1)(A), and is responsive to U.S. EPA guidance developed in response to a 2011 Ninth Circuit Court of Appeals ruling on this section of the Act. Appendix VIII of the 2012 AQMP demonstrates that emissions due to VMT growth are appropriately offset by transportation control strategies and transportation control measures in the attainment years of 2022 for the 1-hour ozone demonstration in the 2012 AQMP, and 2023 for the approved 8-hour ozone SIP. The 2012 AQMP also includes an additional demonstration that VMT emission reductions for the 8-hour ozone meet an alternative VMT offsets methodology proposed by U.S. EPA.

E. Reasonably Available Control Measures Analysis

As specified in the Act, SIPs shall provide for the implementation of all Reasonably Available Control Measures (RACM) as expeditiously as practicable, including at minimum Reasonably Available Control Technology (RACT), and

shall provide for attainment of the standards. U.S. EPA has decided to interpret this as those measures that are technologically and economically feasible and when considered in aggregate, would advance the attainment date by at least one year.

The District RACM/RACT demonstration includes a comparison of stationary source measures the District has implemented or plans to implement with measures implemented by other agencies within and outside of the State. For the majority of stationary and area source categories, the District rules are the most stringent in California. Where necessary, the District identified for adoption by the district additional measures in the 2012 AQMP.

Based U.S. EPA guidance, the District concluded the 2012 AQMP meets the RACM/RACT requirements of the CAA, and the U.S. EPA's PM2.5 Implementation Rule[7]. These requirements include a demonstration that no additional feasible measures could be identified that could, in aggregate, accelerate attainment by one year. The complete RACM and RACT assessment is provided in Appendix VI of the 2012 AQMP.

In addition, U.S. EPA's RACM guidelines call for an analysis of transportation control measures proposed in the plan. Consequently, the Southern California Association of Governments (SCAG) has completed a RACM determination for transportation control measures that can be found in Appendix IV-C of the 2012 AQMP.

California's comprehensive mobile source program continues to be RACM as it expands and further reduces emissions. Given the significant emission reductions needed for attainment in California, ARB has adopted the most stringent control measures nationwide for on-road and off-road mobile sources and the fuels that power them. These measures provide a significant amount of emission reductions needed for the South Coast Air Basin to attain the PM2.5 standard.

For 1-hour the RACM demonstration, the District staff's analysis, found in Attachment 2 of Appendix VII, concluded that it has developed effective controls to meet the 1-hour ozone attainment date as expeditiously as possible.

F. Environmental Impacts

The South Coast Air Quality Management District prepared a Draft Program Environmental Impact Report (Draft Program EIR) for the 2012 AQMP. The Draft Program EIR was released for a 45-day public review and comment period from September 7, 2012 to October 23, 2012. The Draft Program EIR concluded that the 2012 AQMP has the potential to generate significant adverse environmental

[7] 72 FR 20586

impacts to the following environmental topic areas: construction air quality, energy (increased electricity and natural gas demand), hazards and hazardous materials, water demand, construction noise, and transportation and traffic.

Measures were identified to mitigate to the maximum extent feasible potentially significant adverse impacts to all environmental topics identified above. In spite of implementing all feasible mitigation measures, impacts to all environmental topics remained significant. In addition, the Draft Program EIR included an analysis of potentially significant adverse cumulative environmental impacts and identified and evaluated the relative merits of four project alternatives, including a No Project Alternative. The District included the comment letters received on the Draft Program EIR and written responses in Appendix G of the Final Program EIR.

At the December 7, 2012 public hearing when the District Governing Board adopted the 2012 AQMP, it also the certified and adopted the Final Program EIR, and adopted a Statements of Findings and Overriding Considerations and a Mitigation Monitoring Plan.

V. Staff Recommendations

ARB staff recommends that the Board:

1. Approve the South Coast Air District Air Quality Management Plan as a revision to the California SIP with attainment demonstrations for the 24-hour 35 PM2.5 standard by 2014 and the 1-hour ozone standard by 2022;

2. Direct staff to work with the District staff on implementation of the actions identified in the AQMP to accelerate use of advanced technologies to fulfill the existing 182(e)(5) SIP commitments;

3. Direct staff to work with the District to staff to provide annual reports to U.S. EPA describing progress toward meeting section 182(e)(5) emission reduction commitments;

4. Direct the Executive Officer to submit the South Coast 2012 AQMP to U.S. EPA as a revision to the California SIP.

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

Office of the Executive Officer
Barry R. Wallerstein, D.Env.
909.396.2100, fax 909.396.3340

December 20, 2012

James Goldstene
Executive Officer
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Deborah Jordan, Air Division
Director
U.S. EPA, Region IX
75 Hawthorne Street
San Francisco, CA, 94105

Submittal of 2012 Air Quality Management Plan

Dear Mr. Goldstene and Ms. Jordan,

At its December 7, 2012 meeting, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted the 2012 Air Quality Management Plan (AQMP or Plan). The 2012 AQMP, as approved, is submitted addressing the following Federal Clean Air Act requirements:

- 24-hour PM2.5 Plan
- 8-hour ozone additional measures and vehicle miles traveled (VMT) offset demonstration
- 1-hour ozone attainment demonstration and VMT offset demonstration

Our agency would appreciate an expedited staff review and California Air Resources Board (CARB) consideration at the earliest possible date. Changes indicated in underline and strikeout format in Attachment F to the Board Letter and the Errata sheet, as well as motions described below, have been incorporated in the attached Final 2012 AQMP.

The Governing Board approved two motions along with the adoption of the 2012 AQMP. The first motion was to remove CTS-04 from the 2012 AQMP, which contains the low vapor pressure (LVP) exemption issue, and prepare a letter from SCAQMD Chairman Dr. Burke to CARB Chairman Nichols requesting a study which evaluates whether some of the exempt LVP substances contribute to ozone and should be further controlled for ozone attainment purposes. The letter will offer our technical assistance and possible funding assistance for each study, and emphasize the need to partner with affected businesses in conducting such a study.

The second approved motion is to continue the hearing to the February 1, 2013 Governing Board meeting only on including control measure IND-01, the Port Backstop Measure, into the Final 2012 AQMP. Staff will prepare a detailed presentation on the need and legal basis for the Port Backstop Measure to the Marine Port Committee and continue to seek input on the Port Backstop measure from interested parties during the interim period. A special effort will be made between SCAQMD and the Ports of Los Angeles and Long Beach to resolve the existing differences. Any further action taken by the Governing Board at its February hearing will be transmitted to CARB and the U.S. Environmental Protection Agency (EPA) for review and approval if a SIP revision is warranted. However, we request processing the enclosed SIP submittal without waiting for the results of the February 1, 2013 Governing Board meeting.

We also request U.S. EPA to immediately begin concurrent review, and especially expedite review and action on the 1-hour ozone attainment demonstration, since it is an issue in current litigation by certain environmental groups.

In order to expedite your review and approval process, the following documents that were approved at our December 7, 2012 Hearing are being submitted on the attached CDs. Per request from CARB staff, three hardcopies of the Board Letter, Resolution and Final 2012 AQMP are also attached. Finally, due to the size of CMAQ modeling files, SCAQMD staff will coordinate with CARB modeling staff on a method of transfer.

- Approved Board Letter regarding the 2012 AQMP and related documents
- Governing Board Adoption Resolution 12-19 certifying the Final Environmental Impact Report and adopting the Final 2012 AQMP
- Final 2012 AQMP (December 2012), including the following appendices:
    - Appendix I – Health Effects
    - Appendix II – Current Air Quality
    - Appendix III - Base and Future Year Emission Inventory
    - Appendix IV (A) - District's Stationary Source Control Measures
    - Appendix IV (B) - Proposed Section 182(e)(5) Implementation Measures
    - Appendix IV (C) - Regional Transportation Strategies & Control Measures
    - Appendix V - Modeling & Attainment Demonstrations
    - Appendix VI - Reasonably Available Control Measures (RACM) Demonstration
    - Appendix VII - 1-hour Ozone Attainment Demonstration
    - Appendix VIII - VMT Offset Requirement Demonstration
- Proof of Publication for Notices of Public Hearings
- Response to Comments on the 2012 Air Quality Management Plan (November 2012)
- Final Program Environmental Impact Report for the 2012 AQMP (November 2012)
- Final Socioeconomic Report for the 2012 AQMP (December 2012)

If you have any questions, please contact me at (909) 396-2100 or Dr. Elaine Chang, Deputy Executive Officer, at (909) 396-3186.

Sincerely,

Barry R. Wallerstein, D.Env.
Executive Officer

Attachments

cc: Elaine Chang, SCAQMD
Hasan Ikhrata, SCAG (w/o Attachments)
Barbara Baird, SCAQMD
Laki Tisopulos, SCAQMD
Philip Fine, SCAQMD

EC:PMF:MK:afm

ATTACHMENT A
RESOLUTION NO. 12-19

A Resolution of the South Coast Air Quality Management District (AQMD or District) Governing Board Certifying the Final Program Environmental Impact Report for the 2012 Air Quality Management Plan (AQMP), adopting the Draft Final 2012 AQMP, to be referred to after adoption as the Final 2012 AQMP, and to be submitted into the California State Implementation Plan.

WHEREAS, the U.S. Environmental Protection Agency (U.S. EPA) promulgated a 24-hour fine particulate matter (PM2.5) national ambient air quality standard (NAAQS or standard) in 2006, and 8-hour ozone NAAQS in 1997, followed up by implementation rules which set forth the classification and planning requirements for State Implementation Plans (SIP); and

WHEREAS, the South Coast Air Basin was classified as nonattainment for the 2006 24-hour PM2.5 standard on December 14, 2009, with an attainment date by December 14, 2014; and

WHEREAS, the U.S. EPA revoked the 1-hour ozone standard effective June 15, 2005, but on September 19, 2012 issued a proposed call for a California SIP revision for the South Coast to demonstrate attainment of the 1-hour ozone standard; and

WHEREAS, the 1997 8-hour ozone standard became effective on June 15, 2004, with an attainment date for the South Coast of **June 15**, 2024; and amended 12-7-12 Son

WHEREAS, the South Coast Air Basin was classified as "extreme" nonattainment for 8-hour ozone for the 1997 standard with attainment dates by 2024; and

WHEREAS, EPA approved the South Coast SIP for 8-hour ozone on March 1, 2012; and

WHEREAS, the federal Clean Air Act requires SIPs for regions not in attainment with the NAAQS be submitted no later than three years after the nonattainment area was designated, whereby, a SIP for the South Coast Air Basin must be submitted for 24-hour PM2.5 by December 14, 2012; and

WHEREAS, the South Coast Air Quality Management District has jurisdiction over the South Coast Air Basin and the desert portion of Riverside County known as the Coachella Valley; and

WHEREAS, 40 Code of Federal Regulations (CFR) Part 93 requires that transportation emission budgets for certain criteria pollutants be specified in the SIP, and

WHEREAS, 40 CFR Part 93.118(e)(4)(iv) requires a demonstration that transportation emission budgets submitted to U.S. EPA are "consistent with applicable requirements for reasonable further progress, attainment, or" maintenance (whichever is relevant to the given implementation plan submission); and

WHEREAS, the South Coast Air Quality Management District is committed to comply with the requirements of the federal Clean Air Act; and

WHEREAS, the Lewis-Presley Air Quality Management Act requires the District's Governing Board adopt an AQMP to achieve and maintain all state and federal air quality standards; to contain deadlines for compliance with federal primary ambient air quality standards; and to achieve the state standards and federal secondary air quality standards by the application of all reasonably available control measures, by the earliest date achievable (Health and Safety Code Section 40462) and the California Clean Air Act requires the District to endeavor to achieve and maintain state ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide by the earliest practicable date (Health and Safety Code Section 40910); and

WHEREAS, the California Clean Air Act requires a nonattainment area to evaluate and, if necessary, update its AQMP under Health & Safety Code §40910 triennially to incorporate the most recent available technical information; and

WHEREAS, the South Coast Air Quality Management District Governing Board is committed to comply with the requirements of the California Clean Air Act; and

WHEREAS, the South Coast Air Quality Management District is unable to specify an attainment date for state ambient air quality standards for 8-hour ozone, PM2.5, and PM10, however, the 2012 AQMP, in conjunction with earlier AQMPs contains every feasible control strategy and measure to ensure progress toward attainment and the AQMP will be reviewed and revised to ensure that progress toward all standards is maintained; and

WHEREAS, the 2012 AQMP must meet all applicable requirements of state law and the federal Clean Air Act; and

WHEREAS, the South Coast Air Quality Management District Governing Board is committed to achieving healthful air in the South Coast Air Basin and all other parts of the District at the earliest possible date; and

WHEREAS, the 2012 AQMP is the result of 17 months of staff work, public review and debate, and has been revised in response to public comments; and

WHEREAS, the 2012 AQMP incorporates updated emissions inventories, ambient measurements, new meteorological episodes, improved air quality modeling analyses, and updated control strategies by the District, and the Southern California Association of Governments (SCAG) and will be forwarded to the California Air Resources Board (CARB) for any necessary additions and submission to EPA; and

WHEREAS, as part of the preparation of an AQMP, in conjunction or coordination with public health agencies such as CARB and the Office of Environmental Health Hazard Assessment (OEHHA), a report has been prepared and peer-reviewed by the Advisory Council on the health impacts of particulate matter air pollution in the South Coast Air Basin pursuant to California Health and Safety Code § 40471, which has been included as part of Appendix I (Health Effects) of the 2012 AQMP together with any required appendices; and

WHEREAS, the 2012 AQMP establishes transportation conformity budgets for the 24-hour PM2.5 standard based on the latest planning assumptions; and

WHEREAS, the AQMP satisfies all the attainment deadlines for federal ambient air quality standards for 24-hour PM2.5 and 1-hour ozone NAAQS; and

WHEREAS, the 2012 AQMP satisfies the planning requirements set forth in the federal and California Clean Air Acts; and

WHEREAS, the 2012 AQMP includes the 24-hour PM2.5 attainment demonstration plan, reasonably available control measure (RACM) and reasonably available control technology (RACT) determinations, and transportation conformity budgets for the South Coast Air Basin; and

WHEREAS, the 2012 AQMP updates the U.S. EPA approved 8-hour ozone control plan with new measures designed to reduce reliance on the federal Clean Air Act (CAA) Section 182(e)(5) long-term measures for NOx and VOC reductions; and

WHEREAS, in order to reduce reliance on the CAA Section 182(e)(5) long-term measures, the SCAQMD will need emission reductions from sources outside of its primary regulatory authority and from sources that may lack, in some cases, the financial wherewithal to implement technology with reduced air pollutant emissions; and

WHEREAS, a majority of the measures identified to reduce reliance on the CAA Section 182(e)(5) long-term measures rely on continued and sustained funding to incentivize the deployment of the cleanest on-road vehicles and off-road equipment; and

WHEREAS, the 2012 AQMP includes a new demonstration of 1-hour ozone attainment (Appendix VII) and vehicle miles travelled (VMT) emissions offsets (Appendix VIII), as per recent proposed U.S. EPA requirements; and

WHEREAS, the South Coast Air Quality Management District Governing Board finds and determines with certainty that the 2012 AQMP is considered a "project" pursuant to CEQA; and

WHEREAS, pursuant to the California Environmental Quality Act (CEQA) a Notice of Preparation (NOP) of a Draft Program Environmental Impact Report (PEIR) and Initial Study for the 2012 AQMP was prepared and released for a 30-day public comment period, preliminarily setting forth the potential adverse environmental impacts of adopting and implementing the 2012 AQMP; and

WHEREAS, pursuant to CEQA a Draft PEIR on the 2012 AQMP (State Clearinghouse Number 2012061093), including the NOP and Initial Study and responses to comments on the NOP and Initial Study, was prepared and released for a 45-day public comment period, setting forth the potential adverse environmental impacts of adopting and implementing the 2012 AQMP; and

WHEREAS, the Draft PEIR on the 2012 AQMP included an evaluation of project-specific and cumulative direct and indirect impacts from the proposed project and four project alternatives; and

WHEREAS, the AQMD staff reviewed the 2012 AQMP and determined that it may have the potential to generate significant adverse environmental impacts; and

WHEREAS, the Draft PEIR on the 2012 AQMP has been revised based on comments received and modifications to the draft 2012 AQMP and all comments received were responded to, such that it is now a Final PEIR on the 2012 AQMP; and

WHEREAS, the Governing Board finds and determines, taking into consideration the factors in §(d)(4)(D) of the Governing Board Procedures, that the modifications that have been made to 2012 AQMP, since the Draft PEIR on the 2012 AQMP was made available for public review would not constitute significant new information within the meaning of the CEQA Guidelines; and

WHEREAS, none of the modifications to the 2012 AQMP alter any of the conclusions reached in the Draft PEIR on the 2012 AQMP, nor provide new information of substantial importance that would require recirculation of the Draft PEIR on the 2012 AQMP pursuant to CEQA Guidelines §15088.5; and

WHEREAS, it is necessary that the adequacy of the Final PEIR on the 2012 AQMP be determined by the AQMD Governing Board prior to its certification; and

WHEREAS, it is necessary that the adequacy of responses to all comments received on the Draft PEIR on the 2012 AQMP be determined prior to its certification; and

WHEREAS, it is necessary that the AQMD prepare Findings and a Statement of Overriding Considerations pursuant to CEQA Guidelines §§15091 and 15093, respectively, regarding adverse environmental impacts that cannot be mitigated to insignificance; and,

WHEREAS, Findings and a Statement of Overriding Considerations have been prepared and are included in Attachment 2 to this Resolution, which is attached and incorporated herein by reference; and

WHEREAS, the provisions of Public Resources Code §21081.6 – Mitigation Monitoring and Reporting - require the preparation and adoption of implementation plans for monitoring and reporting measures to mitigate adverse environmental impacts identified in environmental documents; and

WHEREAS, staff has prepared such a plan which sets forth the adverse environmental impacts, mitigation measures, methods, and procedures for monitoring and reporting mitigation measures, and agencies responsible for monitoring mitigation measure, which is included as Attachment 2 to the Resolution and incorporated herein by reference; and

WHEREAS, the South Coast Air Quality Management District Governing Board voting on this Resolution has reviewed and considered the Final Program Environmental Impact Report on the 2012 AQMP, including responses to comments on the Draft Program Environmental Impact Report on the 2012 AQMP, the Statement of Findings, Statement of Overriding Considerations, and the Mitigation Monitoring and Reporting Plan; and

WHEREAS, the Draft Socioeconomic Report on the 2012 AQMP was prepared and released for public review and comment; and

WHEREAS, the Draft Socioeconomic Report for the 2012 AQMP is revised based on comments received and modifications to the Draft 2012 AQMP such that it is now a Draft Final Socioeconomic Report for the 2012 AQMP; and

WHEREAS, the 2012 AQMP includes every feasible measure and an expeditious adoption schedule; and

WHEREAS, the CARB and the U.S. EPA have the responsibility to control emissions from motor vehicles, motor vehicle fuels, and non-road engines and consumer products which are primarily under their jurisdiction representing over 80 percent of ozone precursor emissions in 2023; and

WHEREAS, significant emission reductions must be achieved from sources under state and federal jurisdiction for the South Coast Air Basin to attain the federal air quality standards; and

WHEREAS, the formal deadline for submission of the 24-hour PM2.5 attainment plan is December 14, 2012, and the formal deadline for submission of the 1-hour ozone SIP revision is expected to be late 2013 or early 2014, but since the emissions inventory and control strategy for ozone has already been developed for the 2012 AQMP, and attaining the 1-hour ozone standard can rely on the same strategy for the 8-hour ozone standard, an attainment demonstration for the 1-hour ozone standard is included as an Appendix to the 2012 AQMP; and

WHEREAS, the 1-hour ozone attainment demonstration (Appendix VII) uses the same base year (2008) and future year inventories as presented in Appendix III of the 2012 AQMP and satisfies the pre-base year offset requirement by including pre-base year emissions in the growth projections, consistent with 40 CFR § 51.165(a)(3)(i)(C)(1), as described on page III-2-54 of Appendix III of the 2012 AQMP.

WHEREAS the South Coast Air Quality Management District Governing Board hereby requests that CARB commit to submitting contingency measures as required by Section 182(e)(5) as necessary to meet the requirements for demonstrating attainment of the 1-hr ozone standard; and

WHEREAS, the South Coast Air Quality Management District Governing Board directs staff to move expeditiously to adopt and implement feasible new control measures to achieve long-term reductions while meeting all applicable public notice and other regulatory development requirements; and

WHEREAS, the South Coast Air Quality Management District has held six public workshops on the Draft 2012 AQMP, one public workshop on the Draft Socioeconomic Report, four public hearings throughout the four-county region in September on the Revised Draft 2012 AQMP, 14 AQMP Advisory Group meetings, 11 Scientific, Technical, and Modeling, Peer Review Advisory Group meetings, four public hearings in November throughout the four-county region on the Draft Final 2012 AQMP, and one adoption hearing pursuant to section 40466 of the Health and Safety Code; and

WHEREAS, pursuant to section 40471(b) of the Health and Safety Code, as part of the six public workshops on the Draft 2012 AQMP, four public hearings on the Revised Draft 2012 AQMP, the four public hearings on the Draft Final 2012 AQMP, and adoption hearing, public testimony and input were taken on Appendix I (Health Effects); and

WHEREAS, the record of the public hearing proceedings is located at South Coast Air Quality Management District, 21865 Copley Drive, Diamond Bar, California 91765, and the custodian of the record is the Clerk of the Board; and

WHEREAS, an extensive outreach program took place that included over 75 meetings with local stakeholders, key government agencies, focus groups, topical workshops, and over 65 presentations on the 2012 AQMP provided; and

WHEREAS, the record of the CEQA proceedings is located at South Coast Air Quality Management District, 21865 Copley Drive, Diamond Bar, California 91765, and the custodian of the record is the Assistant Deputy Executive Officer, Planning, Rule Development, and Area Sources.

NOW, THEREFORE BE IT RESOLVED, that the South Coast Air Quality Management District Governing Board does hereby certify that the Final PEIR for the 2012 AQMP including the responses to comments has been completed in compliance with the requirements of CEQA and finds that the Final PEIR on the 2012 AQMP, including responses to comments, was presented to the AQMD Governing Board, whose members reviewed, considered and approved the information therein prior to acting on the 2012 AQMP; and finds that the Final PEIR for the 2012 AQMP reflects the AQMD's independent judgment and analysis; and

BE IT FURTHER RESOLVED, that the District will develop, adopt, submit, and implement the short-term PM2.5 control measures as identified in Table 4-2 and the 8-hour ozone measures in Table 4-4 of Chapter 4 in the 2012 AQMP (Main Document) as expeditiously as possible in order to meet or exceed

the commitments identified in Tables 4-10 and 4-11 of the 2012 AQMP (Main Document), and to substitute any other measures as necessary to make up any emission reduction shortfall.

BE IT FURTHER RESOLVED, the District commits to update AQMP emissions inventories, baseline assumptions and control measures as needed to ensure that the best available data is utilized and attainment needs are met.

BE IT FURTHER RESOLVED, the District commits to conduct a review of its socioeconomic analysis methods during 2013, convene a panel of experts, and update assessment methods and approaches, as appropriate.

BE IT FURTHER RESOLVED, the District commits to continue working with the ports on the implementation of control measure IND-01 (Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Sources).

BE IT FURTHER RESOLVED, that the Executive Officer is hereby directed to enhance outreach and education efforts related to the "Check before you Burn" residential wood burning curtailment program, and to expand the current incentive programs for gas log buydown and to include potentially wood stove replacements working closely with U.S. EPA and other stakeholders.

amended 12-7-12 BM

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board does hereby direct staff to work in conjunction with CARB to provide annual reports to U.S. EPA describing progress towards meeting Section 182(e)(5) emission reduction commitments.

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board, pursuant to the requirements of Title 14 California Code of Regulations, does hereby adopt the Statement of Findings pursuant to §15091, and adopts the Statement of Overriding Considerations pursuant to §15093, included in Attachment 2 and incorporated by reference; and

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board, does hereby adopt the Mitigation Monitoring and Reporting Plan, as required by Public Resources Code, Section 21081.6, attached hereto and incorporated by reference; and

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board finds that the mobile source control measures contained in Appendix IV-B are technically feasible and cost-effective and requests that CARB consider them in any future incentives programs or rulemaking.

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board does hereby direct staff to work with state agencies and state legislators, federal agencies and U.S. Congressional and Senate members to identify funding sources and secure funding for the expedited replacement of older existing vehicles and off-road equipment to help reduce the reliance on the CAA Section 182(e)(5) long-term measures.

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board finds that transportation emission budgets are "consistent with applicable requirements for reasonable further progress, attainment, or maintenance (whichever is relevant to the given implementation plan submission)" pursuant to 40 CFR 93.118(e)(4)(iv).

BE IT FURTHER RESOLVED, that the Executive Officer is hereby directed to finalize the 2012 AQMP including the main document, appendices, and related documents as adopted at the December 7, 2012 public hearing.

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board, whose members reviewed, considered and approved the information contained in the documents listed herein, adopts the 2012 AQMP dated December 7, 2012 consisting of the document entitled 2012 AQMP as amended by the final changes set forth by the AQMD Governing Board and the associated documents listed in Attachment 1 to this Resolution, the Draft Final Socioeconomic Report for the 2012 AQMP; the Final Program EIR for the 2012 AQMP, and the Statements of Findings and Overriding Considerations and Mitigation Monitoring Plan (Attachment 2 to this Resolution).

BE IT FURTHER RESOLVED, the Executive Officer is hereby directed to work with CARB and the U.S. EPA to ensure expeditious approval of this 2012 AQMP for PM2.5 and 1-hour ozone attainment.

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board, requests that the 2012 AQMP serve as the SIP revision submittal for the 24-hour PM2.5 attainment demonstration plan including the RACM/RACT determinations for the PM2.5 standard for the South Coast Air Basin, and the PM2.5 Transportation Conformity Budgets for the South Coast Air Basin.

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board, requests that the 2012 AQMP (Appendix VII) serve as the SIP revision submittal for the 1-hour ozone NAAQS attainment demonstration.

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board, requests that the 2012 AQMP (Appendix VIII) serve as the SIP revision submittal for a revised VMT emissions offset demonstration as required under Section 182(d)(1)(A) for both the 1-hour ozone and 8-hour ozone SIPs for the South Coast Air Basin.

BE IT FURTHER RESOLVED, that the South Coast Air Quality Management District Governing Board, requests that the 2012 AQMP serve as an update to the approved 2007 8-hour ozone SIP for the South Coast Air Basin with specific control measures designed to further implement the 8-hour ozone SIP and reduce reliance on Section 182(e)(5) long term measures.

BE IT FURTHER RESOLVED, that the 2012 AQMP does not serve as a revision to the previously approved 8-hour ozone SIP with respect to emissions inventories, attainment demonstration, RFP, and transportation emissions budgets or any other required SIP elements.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby directed to forward a copy of this Resolution, the 2012 AQMP and its appendices as amended by the final changes, to CARB, and to request that these documents be forwarded to the U.S. EPA for approval as part of the California State Implementation Plan. In addition, the Executive Officer is directed to forward a copy of this Resolution, comments on the 2012 AQMP and responses to comments, public notices, and any other information requested by the U.S. EPA for informational purposes.

Attachments

AYES: Benoit, Burke, Cacciotti, Gonzales, Loveridge, Lyou, Mitchell, Nelson, Parker, Pulido, and Yates.

NOES: None.

ABSTAIN: None.

ABSENT: Antonovich and Perry.

Dated: 12-7-2012 Saundra McGaniel
Clerk of the District Board

ATTACHMENT 1

The Final 2012 Air Quality Management Plan submitted for the South Coast Air Quality Management District Governing Board's consideration consists of the documents entitled:

- Draft Final 2012 AQMP (Attachment B) including the following appendices:
  - Appendix I - Health Effects
  - Appendix II - Current Air Quality
  - Appendix III - Base and Future Year Emission Inventory
  - Appendix IV (A) - District's Stationary Source Control Measures
  - Appendix IV (B) - Proposed 8-Hour Ozone Measures
  - Appendix IV (C) - Regional Transportation Strategies & Control Measures
  - Appendix V - Modeling & Attainment Demonstrations
  - Appendix VI - Reasonably Available Control Measures (RACM) Demonstration
  - Appendix VII - 1-Hour Ozone Attainment Demonstration
  - Appendix VIII - VMT Offset Requirement Demonstration
- Comments on the 2012 Air Quality Management Plan, and Responses to Comments (November 2012) – (Attachment C)
- Final Program Environmental Impact Report for the 2012 Air Quality Management Plan (Attachment D)
  - Findings, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Plan (Attachment 2 to the Resolution)
- Draft Final Socioeconomic Report for the 2012 Air Quality Management Plan (Attachment E)
- Changes to Control Measures IND-01, CMB-01, CTS-01 and CTS-04 (Attachment F)

TITLE 13. CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE REGULATIONS FOR GASOLINE AND DIESEL FUEL TEST METHODS

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider adoption of amendments to regulations for Gasoline and Diesel Fuel Test Methods.

DATE: January 25, 2013

TIME: 9:00 a.m.

PLACE: South Coast Air Quality Management District Office
21865 E. Copley Drive
Diamond Bar, CA 91765

This item will be considered at the second day of the Board's January meeting, which will commence at 9:00 a.m., on January 25, 2013. Please consult the agenda for the hearing, which will be available at least 10 days before January 24, 2013, to determine the order on which this item will be considered.

INFORMATIVE DIGEST OF PROPOSED ACTION AND POLICY STATEMENT OVERVIEW

Sections Affected: Proposed amendments to California Code of Regulations, title 13, sections 2262.9, 2263, and 2282.

Documents Incorporated by Reference:

The following documents are incorporated by reference:

ASTM (2009), Standard Test Method for Determination of MTBE, ETBE, TAME, DIPE, tertiary-Amyl Alcohol and C_1 to C_4 Alcohols in Gasoline by Gas Chromatography, in *Annual Book of ASTM Standards*, Method D4815-09, ASTM International, West Conshohocken, Pennsylvania, 2009.

ASTM (2009), Standard Test Method for Determination of Aromatic Content and Polynuclear Aromatic Content of Diesel Fuels and Aviation Turbine Fuels by Supercritical Fluid Chromatography, in *Annual Book of ASTM Standards*, method D5186-03(2009), ASTM International, West Conshohocken, Pennsylvania, 2003, reapproved without change, 2009.

ASTM (2007), Standard Test Method for Determination of Benzene, Toluene, Ethylbenzene, p/m Xylene, o Xylene, C9 and Heavier Aromatics, and Total Aromatics in Finished Gasoline by Gas Chromatography, in *Annual Book of ASTM Standards,* method D5580-02(2007) , ASTM International, West Conshohocken, Pennsylvania, 2002, reapproved without change, 2007.

ASTM (2010), Standard Test Method for Determination of Olefin Content of Gasolines by Supercritical Fluid Chromatography, in *Annual Book of ASTM Standards*, method D6550-10, ASTM International, West Conshohocken, Pennsylvania, 2010.

ASTM (2007), Standard Test Method for Determination of Olefin Content in Denatured Ethanol by Supercritical Fluid Chromatography, in *Annual Book of ASTM Standards*, method D7347-07e1, ASTM International, West Conshohocken, Pennsylvania, 2007.

ASTM (2010), Standard Test Method for Determination of Benzene and Total Aromatics in Denatured Fuel Ethanol by Gas Chromatography, in *Annual Book of ASTM Standards*, method D7576-10, ASTM International, West Conshohocken, Pennsylvania, 2010.

ASTM (2011), Standard Test Method for Determination of Trace Oxygenates in Automotive Spark Ignition Engine Fuel by Multidimensional Gas Chromatography, in *Annual Book of ASTM Standards*, method D7754-11, ASTM International, West Conshohocken, Pennsylvania, 2011.

Background:

ARB regulates the physical and chemical properties of California reformulated gasoline (CARFG) and California diesel fuel (CDF) in order to reduce harmful vehicle emissions. The regulations specify a test method to determine the presence and amount of each regulated property in a fuel sample. These test methods are updated when better methods become available or when newer versions of existing methods offer improvements in accuracy, precision, or ease of use.

ARB adopted Phase 3 CARFG regulations in December, 1999, taking effect in December, 2003. The primary change implemented in Phase 3 was the prohibition of methyl *tert*-butyl ether (MTBE) and most other oxygenates, with ethanol as the only permitted oxygenate remaining, unless a multimedia evaluation allows for an alternative. Specifications for allowable levels of MTBE and other prohibited oxygenates were added, along with specifications for denatured ethanol intended for blending with California Reformulated Gasoline Blendstock for Oxygenate Blending (CARBOB).

The test method currently specified for measuring MTBE and other prohibited oxygenates is not capable of measuring these compounds at the levels specified in the regulations, and therefore neither ARB nor stakeholders have the means to determine whether a gasoline meets these regulatory requirements.

The specifications for denatured ethanol adopted in the Phase 3 CARFG regulations include limits on the allowable concentrations of benzene, total aromatic hydrocarbons, and olefins. These classes of compounds do not exist naturally in ethanol. Their presence is due to the addition of the denaturant, which is typically gasoline, and is added to discourage human ingestion of the ethanol. Since no test methods for measuring these compounds in denatured ethanol existed at the time, the regulations state that compliance is to be determined by analyzing the denaturant before it is

blended into the pure ethanol. The vast majority of denatured ethanol used in California is produced outside the state, and as a result, ARB cannot adequately enforce these denatured ethanol specifications. Additionally, stakeholders such as terminal operators and fuel blenders have no way to check whether the denatured ethanol they use meets the state's requirements.

Objectives and Benefits:

ARB is required to adopt and implement motor vehicle fuel specifications for the control of air contaminants and sources of air pollution, to eliminate MTBE from California gasoline, and to achieve the maximum feasible reductions from motor vehicles and motor vehicle fuels in order to attain state standards at the earliest practicable date. The CARFG and CDF regulations were designed with these goals in mind, taking into account cost-effectiveness and technological feasibility.

The proposed amendments will better enable ARB and stakeholders to adequately measure the chemical properties of CARFG and denatured ethanol to determine their compliance with ARB's fuel regulations. In addition, updates to the more recent versions of the test methods will correct errors, provide additional information, and streamline test procedures. A more detailed discussion of the purpose and benefits of the proposed amendments may be found in the Initial Statement of Reasons.

Staff's Proposal:

New test for MTBE and other prohibited oxygenates – ARB staff has worked with the Western States Petroleum Association (WSPA), ASTM International (formerly the American Society for Testing and Materials), and other stakeholders to develop a new test method, ASTM D7754-11, for measuring oxygenates at the low levels specified in the Phase 3 CARFG regulations. Staff is proposing the adoption of this new test method, enabling improved enforcement of the CARFG regulations.

New test methods for denatured ethanol - ARB staff has worked WSPA, ASTM International, and other stakeholders to develop new test methods for measuring benzene, total aromatic hydrocarbons, and olefins in denatured ethanol. Staff is proposing the adoption of these new test methods (ASTM D7576-10 for aromatic hydrocarbons and benzene; ASTM D7347-07e1 for olefins), enabling improved enforcement of the CARFG regulations and providing the capability of testing denatured ethanol to stakeholders such as terminal operators and fuel blenders. Staff is proposing to retain the existing method of indirectly measuring these compounds in the denaturant and applying a dilution factor to determine the concentration in the denatured ethanol. However, in the event of a discrepancy between the direct testing of the denatured ethanol and the indirect testing of the denaturant, the results of testing the denatured ethanol shall take precedence.

Updates to existing test methods – ARB staff works with WSPA, ASTM International, and other stakeholders on an ongoing basis to improve existing test methods. Staff is proposing to update the test methods for measuring benzene, aromatic hydrocarbons, olefins, and ethanol in CARFG and aromatics in CDF to their most recent published versions. Specifically, staff proposes that the test method for future analyses of olefins in California gasoline be updated from ASTM D6550-00 to ASTM D6550-10, for future analyses of permitted oxygenates in California gasoline be updated from ASTM D4815-04 to ASTM D4815-09, future analyses of benzene and aromatic hydrocarbons in gasoline be updated from ASTM D5580-00 to ASTM D5580-07, and future analyses of aromatic hydrocarbons and polycyclic aromatic hydrocarbons in California diesel fuel be updated from ASTM D5186-96 to ASTM D5186-03(2009). These updates offer corrections of minor errors, new precision statements, and/or simplified test procedures.

Change in test method for sulfur in California gasoline – The CARFG regulations currently allow the use of either ASTM D2622-94 or ASTM D5453-93 for the measurement of sulfur in California gasoline. Staff is proposing to eliminate the use of ASTM D2622-94 and to refer exclusively on ASTM D5453-93 for future tests, because ASTM D5453-93 is more sensitive, and therefore, more appropriate for lower levels of sulfur in gasoline.

CONSISTENCY AND COMPATIBILITY WITH EXISTING STATE REGULATIONS

The proposed amendments are neither inconsistent nor incompatible with existing state regulations.

COMPARABLE FEDERAL REGULATIONS

The United States Environmental Protection Agency (U.S. EPA) administers federal RFG regulations requiring that gasoline sold in various areas of the country with poor air quality meet standards for federal reformulated gasoline. Most gasoline sold in California is subject to the federal RFG standards as well as having to meet the CARFG standards. All diesel fuel sold in California is subject to both California and federal standards. These standards work complimentarily.

The ARB has worked with U.S. EPA and fuel producers to avoid unnecessary duplication and conflicts between the federal and state enforcement agencies. As a result of this cooperative effort, the federal regulations allow producers and importers of California gasoline and diesel fuel to use test methods specified in the ARB's regulations in lieu of the otherwise applicable federal methods (40 CFR section 80.81(h)).

STATE IMPLEMENTATION PLAN REVISION

If adopted by ARB, ARB plans to submit the proposed regulatory action to the U.S. EPA for approval as a revision to the California State Implementation Plan (SIP) required by the federal Clean Air Act (CAA). The adopted regulatory action would be submitted as a SIP revision because it amends regulations intended to reduce emissions of air

pollutants in order to attain and maintain the National Ambient Air Quality Standards promulgated by U.S. EPA pursuant to the CAA.

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: "Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Amendments to the Regulations for Gasoline and Diesel Fuel Test Methods."

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, First Floor, Sacramento, California, 95814, (916) 322-2990, on December 5, 2012.

Final Statement of Reasons Availability

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.

Agency Contact Persons

Inquiries concerning the substance of the proposed regulation may be directed to the designated agency contact persons, Dr. Judson Cohan at (626) 575-6792 or Mr. Paul Rieger at (626) 575-6876.

Further, the agency representative and designated back-up contact persons, to whom nonsubstantive inquiries concerning the proposed administrative action may be directed are Ms. Lori Andreoni, Manager, Board Administration and Regulatory Coordination Unit, (916) 322-4011, or Ms. Trini Balcazar, Regulations Coordinator, (916) 445-9564. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

Internet Access

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on ARB's website for this rulemaking at http://www.arb.ca.gov/regact/2013/diesel2013/diesel2013.htm

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.

DISCLOSURES REGARDING THE PROPOSED REGULATION

Pursuant to Government Code sections 11346.5(a)(5) and 11346.5(a)(6), the Executive Officer has determined that the proposed regulatory action would create costs to ARB of approximately $90,000 over a five year period. The proposed regulatory action would not create costs or savings to any other 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 Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to State or local agencies.

COST IMPACTS ON REPRESENTATIVE PRIVATE PERSONS OR BUSINESSES

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. The CARFG and CDF regulations do not require refiners, producers, or importers to test their fuels. However, if the refiners, producers, or importers were to voluntarily choose to test their fuels using the test methods specified in the proposed amendments, they would incur costs of approximately $1.2 million over a five year period, equal to approximately 0.002 cents per gallon of CARFG produced. The only proposed amendment to the CDF regulations is an update to one test method; that proposed amendment streamlines the testing of CDF by reducing the number of quality control (QC) samples. As a result, if CDF refiners, producers, or importers were to test their CDF using the test method specified in the proposed amendment, they would reduce their costs due to less time performing QC and less materials and waste associated with the QC. The ARB is not aware of any cost impacts that a representative private person or any other business would necessarily incur in reasonable compliance with the proposed action. This is because the proposed amendments do not change the specifications of the CARFG or CDF and are not expected to increase the production costs.

SIGNIFICANT STATEWIDE ADVERSE ECONOMIC IMPACT DIRECTLY AFFECTING BUSINESS, INCLUDING ABILITY TO COMPETE

The Executive Officer has made an initial determination that the proposed regulatory action would 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.

STATEMENT OF THE RESULTS OF THE ECONOMIC IMPACT ASSESSMENT PREPARED PURSUANT TO GOVERNMENT CODE SEC. 11346.3(b)

The Executive Officer has determined that the proposed regulatory action would 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.

BENEFITS OF THE PROPOSED REGULATION:

The proposed amendments are simply changing or updating test methods that are specified in CaRFG and CDF regulations. No direct impacts to the health, safety, and welfare of California residents, worker safety, or the state's environment and quality of life are anticipated. No economic benefits are expected from the proposed regulatory action.

EFFECT ON SMALL BUSINESS

The Executive Officer has also determined, pursuant to California Code of Regulations, title 1, section 4, that the proposed regulatory action would not affect small businesses because only gasoline refiners are affected, and no gasoline refiners are small businesses.

ALTERNATIVES

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 (which includes during preliminary workshop activities), 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, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law.

ENVIRONMENTAL ANALYSIS

In accordance with ARB's certified regulatory program, California Code of Regulations, title 17, sections 60006 through 60007, and the California Environmental Quality Act, Public Resources Code section 21080.5, ARB has conducted an analysis of the potential for significant adverse and beneficial environmental impacts associated with the proposed regulatory action. The environmental analysis of the proposed regulatory action can be found in Chapter 6 of the ISOR.

SUBMITTAL OF COMMENTS AND WRITTEN COMMENT PERIOD

Interested members of the public may also present comments orally or in writing at the meeting, and comments may be submitted by postal mail or by electronic submittal before the meeting. The public comment period for this regulatory action will begin on December 10, 2012. To be considered by the Board, written comments, not physically submitted at the meeting, must be submitted on or after December 10, 2012 and received no later than 12:00 noon January 23, 2013, and must be 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

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the hearing so that ARB staff and Board members have additional time to 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, 43013, 43013.1, 43018, and 43101, Health and Safety Code, and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). This regulatory action is proposed to implement, interpret, and make specific sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, 43101, and 43830.8, Health and Safety Code, and Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

HEARING PROCEDURES

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Government Code, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

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 and 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, First Floor, Sacramento, California, 95814, (916) 322-2990.

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language; or
- A disability-related reasonable accommodation.

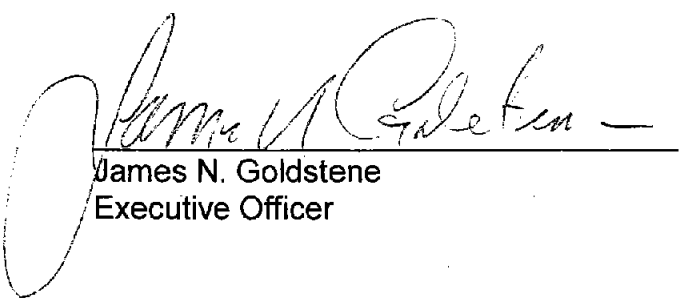
To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia.
- Documentos disponibles en un formato alterno u otro idioma.
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

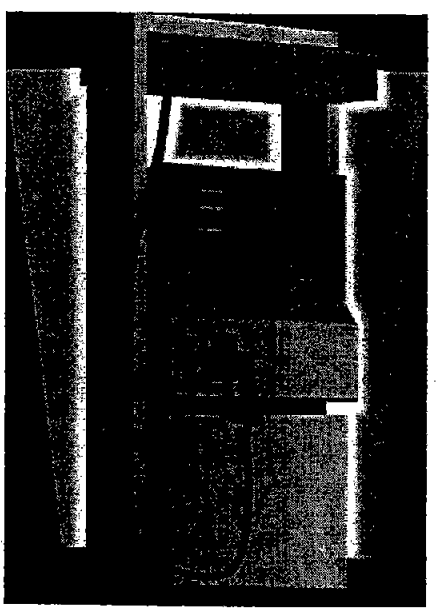


James N. Goldstene
Executive Officer

Date: November 27, 2012

State of California
AIR RESOURCES BOARD

STAFF REPORT:
INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING, PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE REGULATIONS FOR GASOLINE AND DIESEL FUEL TEST METHODS



This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

Date of Release: December 5, 2012
Scheduled for Consideration: January 25, 2013

Acknowledgments

This report was prepared by staff from the Monitoring and Laboratory Division with the assistance and support from several other divisions and offices of the Air Resources Board. In particular we acknowledge the contributions from Enforcement Division, Stationary Source Division, and the Office of Legal Assistance. In addition, we would like to acknowledge the assistance and cooperation from many individuals and organizations. In particular, we would like to thank members of ASTM International Committee D02 on Petroleum Products and the Western States Petroleum Association.

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Fuel Analysis and Methods Evaluation Section
Monitoring and Laboratory Division

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D. Amend Section 2263(b) to Designate ASTM D4815-09 for the Future Analysis of Permitted Oxygenates in California Gasoline
E. Amend Section 2263(b) to Designate ASTM D5580-02(2007) for the Future Analysis of Benzene and Total Aromatic Hydrocarbons in California Gasoline
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Section I - Executive Summary

The Air Resources Board (ARB or Board) staff is proposing to amend the California Reformulated Gasoline (CaRFG) and California Diesel Fuel (CDF) regulations to incorporate new test methods. Over the years, the Board has approved changes to fuel test methods when: new fuel specifications are added to the regulations; improved test methods are developed; and improved versions of existing methods are published. No changes are being proposed to the actual specifications for CaRFG or CDF.

In December 2003, CaRFG Phase 3 (CaRFG3) regulations took effect. These regulations prohibited the use of methyl *tert*-butyl ether (MTBE) and all other oxygenates aside from ethanol unless a multimedia evaluation allows for an alternative, and also provided specifications for certain chemical properties of denatured ethanol intended for blending with California Reformulated Gasoline Blendstock for Oxygenate Blending (CARBOB) (including benzene, total aromatic compounds, and olefins). At the time, no test methods capable of measuring MTBE and other oxygenates at the levels specified by the CaRFG regulations existed. In addition, there were no test methods for adequately and directly measuring the specified chemical properties of denatured ethanol at these levels.

New test methods for measuring these properties have been developed, accepted, and published. ARB staff has actively participated in the development of these new methods. Thus, staff is proposing the incorporation of these new test methods to enable enforcement of the CaRFG regulations and to provide the means for fuel producers, blenders, and shippers to more accurately determine whether their fuels comply with the regulations.

Additionally, ARB staff is proposing to update several existing fuel test methods to their most recent versions. Test methods published by ASTM International (formerly the American Society for Testing and Materials) are updated at least once every five years to: correct miscellaneous errors; reflect newer instrumentation and procedures; provide clarification or new information; or incorporate data from new studies. Adopting these new versions will benefit clean air in California by ensuring that ARB enforcement and other stakeholders can use the best test procedures available.

Staff has held meetings with the Western States Petroleum Association (WSPA) twice per year for the last nine years to discuss these and other fuel test method issues. Additionally, in developing this proposal, staff conducted a public workshop on July 11, 2012.

Staff has determined that incorporation of the proposed new and updated test methods would not result in any potentially significant adverse impacts on the environment, because these are test methods that only improve laboratory analyses and do not add or remove any ingredient from gasoline or diesel fuel.

The gasoline and diesel fuel regulations do not require producers, blenders, or shippers to test their product. If the stakeholders choose to voluntarily test using the

proposed new and updated test methods, staff estimates the cost of complying with the amended regulations at $1.2 - $7.7 million over five years, or approximately 0.002 – 0.012 cents per gallon of gasoline produced. The cost increase would result primarily from acquisition of upgraded analytical instruments. As a result, staff expects no significant change in employment, business competitiveness, or the status of businesses in California due to the proposed change of test methods.

Section II – Introduction and Background

A. Introduction

This report presents the Initial Statement of Reasons (ISOR) in support of proposed amendments to the California Reformulated Gasoline (CaRFG) and California Diesel Fuel (CDF) regulations. The staff of the Air Resources Board (ARB or Board) is proposing to add new test methods to the fuel regulations and to update several existing methods to their most recent versions. These new and updated test methods will be used to determine motor vehicle fuel compliance with ARB's fuel regulations. No changes are being proposed to the actual specifications for CaRFG or CDF.

Monitoring for compliance with fuel specifications promulgated in ARB's CaRFG and CDF regulations is essential for air quality. ARB staff conducts regular week-long fuel inspections, which involve the following steps:

- ARB's Mobile Laboratory is moved to the vicinity of the inspection.
- ARB inspectors obtain samples from refineries, terminals, ports, and service stations without advance notice (Figure A).
- Samples are brought back to the Mobile Laboratory (Figures B and C) and analyzed the same day.
- Analytical results are checked for potential violations. If any are found, the fuel is resampled and reanalyzed the same day or the next day.
- Violating fuels are removed from the marketplace immediately, minimizing any excess air emissions.
- Confirmed violations are referred to ARB legal staff.

In addition to the above inspections, fuel samples are regularly delivered to ARB's El Monte laboratory for analysis.

Figure A. ARB staff collecting a fuel sample.

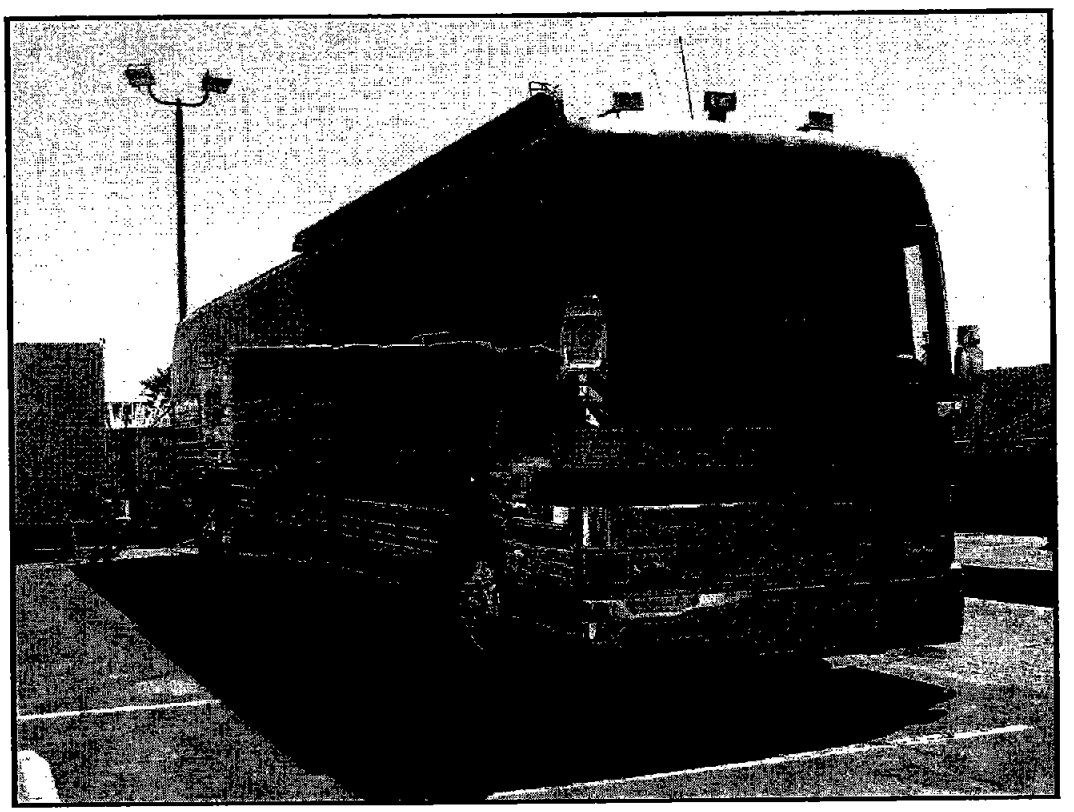

Figure B. Mobile Laboratory exterior

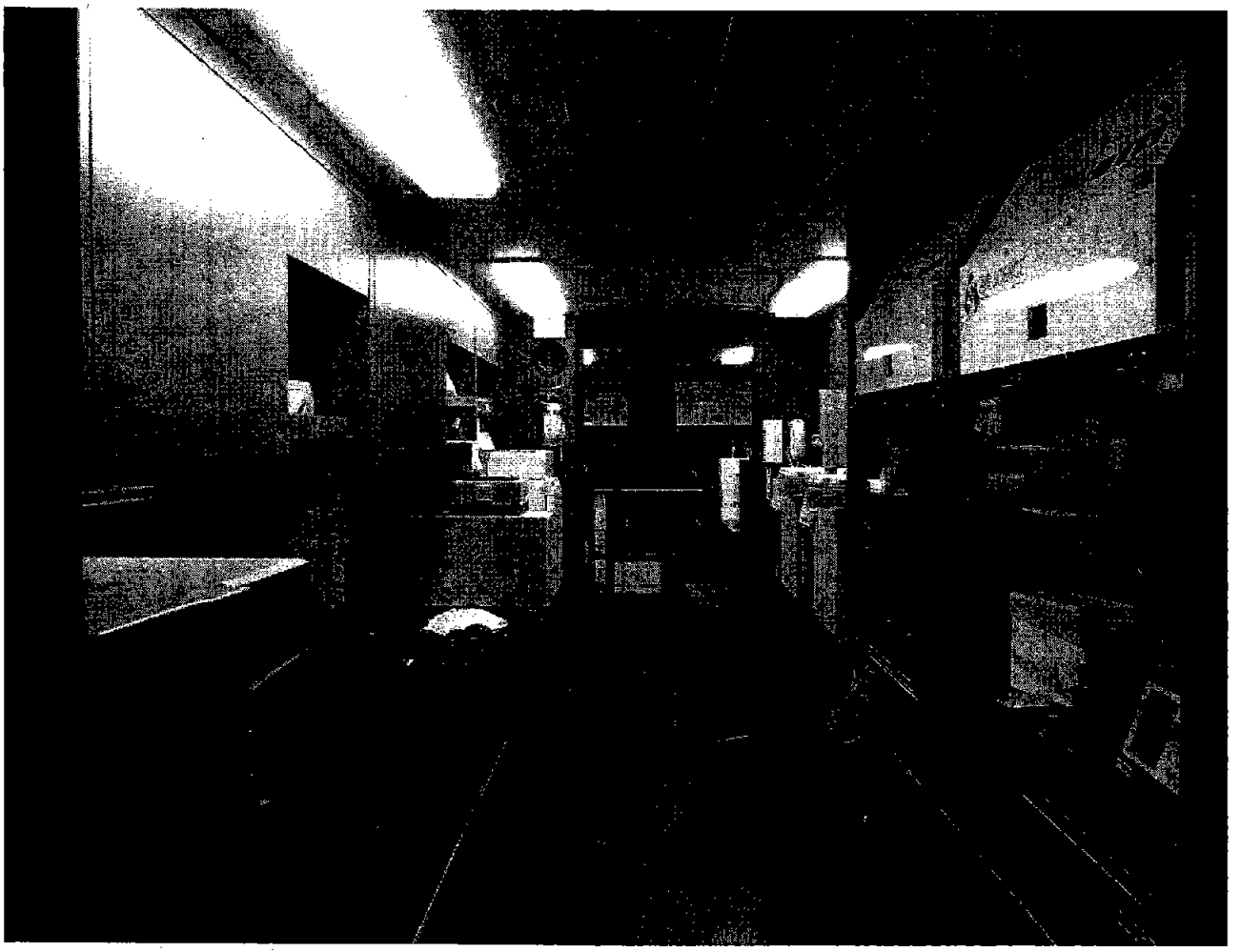

Figure C: Mobile Laboratory interior

B. Legal Requirements

Health and Safety Code (H&SC) section 43013 requires ARB to adopt and implement motor vehicle fuel specifications for the control of air contaminants and sources of air pollution. As the result of the presence of methyl *tert*-butyl ether (MTBE) in groundwater, on March 25, 1999, California's Governor issued Executive Order D-5-99. The Executive Order directed the phase-out of MTBE in California's gasoline. The phase-out of MTBE left ethanol as the only oxygenate allowed to be used in California gasoline. H&SC section 43018 requires ARB to achieve the maximum emission feasible reductions from motor vehicles and motor vehicle fuels. In carrying out this requirement, ARB adopts standards and regulations that produce the most cost-effective combination of control measures on all classes of motor vehicles and motor vehicle fuels, including the specification of vehicular fuel composition. In response, the Board has adopted numerous regulations, including the CaRFG program.

C. California Gasoline Regulations

The CaRFG program is a vital part of ARB's strategy to address motor vehicles and fuels as a system by combining cleaner fuels and motor vehicle controls to achieve the maximum emission reductions at the lowest cost. CaRFG also substantially reduced emissions from existing vehicles. The Board initially adopted the CaRFG program in two phases. Phase 1 of the program required changes to gasoline that could be made in a short time frame and only required small adjustments by producers and importers. Phase 2 was significantly more complex and achieved more emissions reductions.

The Board adopted CaRFG3 regulations in December 1999, taking effect in December 2003. The primary change implemented in CaRFG3 was the prohibition of MTBE and all other oxygenates except ethanol unless a multimedia evaluation was conducted and the California Environmental Policy Council determined that use of an alternative will not cause a significant adverse impact on the public health or the environment. In general, oxygenates such as MTBE and ethanol are used in gasoline to reduce the exhaust emissions of hydrocarbons and carbon monoxide and improve the octane rating. However, as a result of the presence of MTBE in groundwater, California's Governor issued Executive Order D-5-99, directing the phase-out of MTBE in California's gasoline. CaRFG3 added specifications for allowable levels of MTBE and other prohibited oxygenates.

In November 2000, the Board adopted follow-up amendments to CaRFG3 regulations which, among other things, adopted specifications for denatured ethanol intended for blending with CARBOB. Denatured ethanol is ethanol to which a substance has been added to discourage human ingestion. These specifications imposed limits on the sulfur, benzene, olefins, aromatic hydrocarbon, ethanol, methanol, solvent-washed gum, water, denaturant, inorganic chloride, and copper content, as well as limits on the acidity, pHe, and appearance of the denatured ethanol.

In June 2007, the Board adopted amendments, which among other things, lowered the sulfur cap limit from 30 parts per million by weight (ppmw) to 20 ppmw.

Currently, the maximum allowable level of MTBE in California gasoline is 0.05 volume percent, and the maximum allowable oxygen level from all other prohibited oxygenates in gasoline is 0.06 weight percent. The test method currently specified in the CaRFG regulations is not capable of accurately measuring such low levels of oxygenates, and therefore neither ARB nor stakeholders have the means to accurately determine whether a CARBOB or a blend of California gasoline meets these regulatory requirements.

The specifications for denatured ethanol adopted in CaRFG3 regulations include, among others, limits on the allowable concentrations of benzene, total aromatic hydrocarbons, and olefins. These classes of compounds do not exist naturally in ethanol. Their presence is due to the addition of the denaturant, which is typically gasoline. Since no ASTM test methods for adequately measuring these compounds in denatured ethanol existed at the time, the regulations state that compliance is to

be determined by analyzing the denaturant before it is blended into the pure ethanol. The vast majority of denatured ethanol used in California is produced outside the state, and as a result, ARB had no opportunity to analyze the denaturant in order to determine whether the resulting denatured ethanol used in California meets these specifications. Additionally, stakeholders such as terminal operators and fuel blenders have no way to check whether the denatured ethanol they use meets the state's requirements.

D. California Diesel Regulations

In November 1988, ARB approved regulations limiting, among other things, the allowable sulfur content of motor vehicle diesel fuel to 500 parts per million by weight (ppmw) statewide. ASTM method D2622-94 was specified as the test method for measuring the sulfur content in diesel fuel. These diesel fuel regulations, which became effective in 1993, are a necessary part of the state's strategy to reduce air pollution through the use of clean fuels and lower emitting motor vehicles and off-road equipment.

CDF regulations have resulted in significant reductions in emissions from diesel powered vehicles and equipment of sulfur dioxide (SO_2), particulate matter, and oxides of nitrogen (NO_X). California diesel fuel also results in reductions of emissions of several toxic substances, including benzene and polynuclear aromatic hydrocarbons.

In 2004, the Board adopted amendments to CDF, phasing in a new sulfur limit of 15 ppm and requiring the use of ASTM Test Method D 5453-93 or any other test method determined by the ARB Executive Officer to yield equivalent results.

E. Problems

1. Analysis of denatured ethanol in California gasoline

At the time of the development of CaRFG3 regulations, no ASTM test methods for adequately measuring benzene, aromatic hydrocarbons, and olefins in denatured ethanol existed. As a result the regulations provided that compliance is to be determined by analyzing the denaturant before it is blended into the pure ethanol. However, since the vast majority of denatured ethanol used in California is produced outside the state, ARB and downstream stakeholders do not typically have access to the denaturants used in the production of denatured ethanol sold in California. As a result, neither ARB nor gasoline blenders can check the denatured ethanol for compliance with these specifications.

2. Analysis of MTBE and other prohibited oxygenates in California gasoline

The test method currently specified in CaRFG regulations to measure MTBE and other prohibited oxygenates is ASTM D4815-04. However, this method is not capable of accurately measuring low levels of these species. Therefore neither ARB nor stakeholders have the means to accurately determine whether a CARBOB or a blend of California gasoline meets these regulatory requirements.

3. California-specific information for testing olefins in California gasoline

CaRFG regulations currently specify the use of ASTM D6550-00 to determine the olefin content in California gasoline. Additional California-specific information is presently included in the footnotes to the test methods table in section 2263(b). This information relates to the calculation of reproducibility, conversion from mass percent to volume percent olefin, and the range of applicability. Therefore, the analyst must rely on two documents, the ASTM method and the CaRFG regulations, to properly calculate the olefin content in California gasoline. This results in additional inconvenience and confusion to the analyst and is no longer necessary.

4. Analysis of permitted oxygenates in California gasoline

CaRFG regulations currently specify the use of ASTM D4815-04 to determine the ethanol content in California gasoline. However, this method includes minor errors that could cause confusion for analysts learning the method.

5. Analysis of benzene and aromatic hydrocarbons in California gasoline

CaRFG regulations currently specify the use of ASTM D5580-00 and include, in the footnotes to the test methods table in section 2263(b), formulas to determine reproducibility of benzene and total aromatic hydrocarbons. The analyst must rely on two documents, the ASTM method and the CaRFG regulations, to properly calculate reproducibility, resulting in additional inconvenience. The formulas published in ASTM D5580-02(2007) are more appropriate.

6. Analysis of sulfur in California gasoline

Section 2263(b) currently specifies both ASTM D2622-94 and ASTM D5453-93 for the measurement of sulfur in California gasoline. However, ASTM D2622-94 has a limit of quantification of 10 ppm sulfur, which is higher than the levels currently observed in most California gasoline blends. Therefore, ASTM D2622-94 is no longer appropriate for measuring sulfur in California gasoline.

7. Analysis of aromatic hydrocarbons and polycyclic aromatic hydrocarbons in California diesel fuel

CDF regulations currently specify the use of ASTM D5186-96 for the measurement of aromatic hydrocarbons and polycyclic aromatic hydrocarbons in California diesel fuel. The quality control (QC) section of this method requires that laboratories, which analyze a wide variety of diesel fuels, run several different QC samples each day. This can be time-consuming for the analyst.

F. Purpose, Benefits, and Goals of the Regulation

As discussed above in Section II.B., ARB is required to adopt and implement motor vehicle fuel specifications for the control of air contaminants and sources of air

pollution, to eliminate MTBE from California gasoline, and to achieve the maximum feasible reductions from motor vehicles and motor vehicle fuels.

G. Purpose and Benefits of the Amendments

The primary purpose of the proposed amendments is to enable ARB and stakeholders to adequately measure the chemical properties of CaRFG and denatured ethanol to determine their compliance with ARB's fuel regulations. This goal is accomplished by the addition of new test methods to the regulations.

Staff is also proposing to update the regulations for CaRFG and CDF to specify the use of current versions of other existing test methods. The newer versions correct errors, provide additional information, and streamline test procedures.

Staff is also proposing to remove one obsolete CaRFG test method for future analyses. This method is not sufficiently sensitive for California gasoline blends. The environmental impacts analysis is discussed in Section IV. The proposed amendments will not result in any additional environmental impacts.

These proposed amendments will facilitate ARB's implementation of CaRFG and CDF regulations by:

- Specifying direct testing of denatured ethanol for future analyses of benzene, total aromatic hydrocarbons, and olefins, as opposed to indirect testing of the denaturant alone and application of a dilution factor.

- Specifying a new and more sensitive test procedure for future analyses of MTBE and other prohibited oxygenates in California gasoline.

- Deleting reference to the less sensitive ASTM D2622-94 method and specifying the more sensitive ASTM D5453-93 method for the future analyses of sulfur in California gasoline.

In addition, the proposed amendments will aid stakeholders by:

- Specifying the updated ASTM D6550-10 method for future analyses of olefins in gasoline, thereby eliminating the need for the analyst to refer to two documents to properly calculate the olefin content in California gasoline.

- Specifying the updated ASTM D4815-09 method for future analyses of permitted oxygenates in California gasoline, thereby eliminating confusion due to errors in the older version of the test method.

- Specifying the updated ASTM D5580-02 (2007) method for future analyses of benzene and aromatic hydrocarbons in California gasoline, thereby eliminating the need for the analyst to refer to two documents to properly calculate the benzene and aromatic hydrocarbon content in California gasoline.

- Specifying the updated ASTM D5186-03 (2009) method for future analyses of aromatic hydrocarbons and polycyclic aromatic hydrocarbons in California diesel fuel, thereby eliminating the requirement to run multiple QC samples each day.

The proposed amendments may result in additional voluntary costs to gasoline producers and blenders, depending on how they choose to respond to the new regulations. These costs are discussed in Section VIII.

As the proposed amendments merely change or update the test methods that are specified in CaRFG and CDF regulations, no impacts to the health, safety, and welfare of California residents, worker safety, or the state's environment and quality of life are anticipated.

H. Rationale

The proposed amendments satisfy the statutory requirement to implement motor vehicle fuel specifications for the control of air contaminants and sources of air pollution by specifying improved test methods for the determination of prohibited compounds in CaRFG, CDF, and denatured ethanol.

I. Public Process

In developing the proposed amendments, ARB staff hosted a public workshop on July 11, 2012. ARB staff used the Fuels Program e-mail list server to notify interested parties when information became available. The Fuels Program e-mail list server is a self-subscription list with over one thousand individual e-mail addresses. Staff also held several phone calls and meetings with individual stakeholders. In general, staff has been in frequent interaction with the impacted and interested stakeholders over a number of years and as these methods were being improved or developed.

Section III – Reformulated Gasoline and Diesel Fuel Test Methods

A. General Information and Proposed New Test Methods

ARB's CaRFG and CDF regulations contain specifications for various chemical and physical properties of vehicle fuels. Each specification consists of a numerical limit for and a test method by which the property is measured. The test methods are periodically updated to reflect improvements in instrumentation technology or the development of better analytical practices. The test methods for denatured ethanol, gasoline, and diesel fuel are contained in sections 2262.9, 2263(b), and 2282, Title 13, California Code of Regulations (CCR), respectively.

In most cases, the test methods specified are developed through, and published by, ASTM International, sometimes with specified modifications. ASTM International is a prominent not-for-profit organization widely recognized by industry and regulatory agencies that provides a forum for manufacturers and users of products, as well as academicians and government representatives to prepare standards based on a technical and scientific consensus approach. The two digits following the hyphen of an ASTM Test Method designation represent the year of adoption or last revision.

CaRFG3 regulations prohibit the use of all oxygenates other than ethanol and specified maximum allowable concentrations for MTBE and for the total maximum allowable oxygen content from oxygenates other than MTBE and ethanol. These allowable concentrations became lower over time. By July 2007, the maximum concentrations were below the limit of quantification (LOQ) of the specified test method, ASTM D4815-04. The proposed amendments, for future analyses, include the use of ASTM D7754-11, which has a significantly improved LOQ that will facilitate the determination of low levels of MTBE and other prohibited oxygenates.

CaRFG3 regulations also added specifications for denatured ethanol intended for blending with CARBOB. For three of the ethanol specifications (the maximum allowable concentrations of benzene, total aromatic hydrocarbons, and olefins), no adequate test method existed at the time the regulations were adopted. These compounds do not occur as a result of ethanol production; they come from the denaturant. Accordingly, CaRFG regulations call for measuring these compounds in the denaturant before the denaturant is blended with the pure ethanol and multiplying the result by a dilution factor.

ARB and stakeholders such as gasoline producers, blenders, importers, and shippers generally do not typically have access to the denaturant, which is added at the site where the ethanol is produced – typically outside of California. As a result, ARB cannot adequately enforce these denatured ethanol specifications, and other stakeholders have no way to check whether the denatured ethanol they use meets California's requirements based on the current test methodology.

To address these shortcomings, staff has worked closely with ASTM International Committee D02 on Petroleum Products and WSPA over the last nine years to develop new test methods for the regulated compounds in denatured ethanol. Staff is now proposing to incorporate into CARFG regulations, for future analyses, these

new methods, which can directly and adequately measure the amount of benzene, total aromatic hydrocarbons, and olefins in denatured ethanol. The proposed methods are listed in Tables 1 and 2.

Table 1: Proposed New Test Methods for Gasoline

Property	Existing Method	Proposed Method	Regulatory Limit	Proposed Method LOQ
MTBE content	D4815-04	D7754-11	0.05 vol%	0.005 vol%
Oxygen from other compounds	D4815-04	D7754-11	0.06 wt%	0.001 wt%

Table 2: Proposed New* Test Methods for Denatured Ethanol

Property	Existing Method*	Proposed Method	Regulatory Limit	Proposed Method LOQ
Benzene	n/a	D7576-10	0.06 vol%	0.01 vol%
Aromatic hydrocarbons	n/a	D7576-10	1.7 vol%	0.25 vol%
Olefins	n/a	D7347-07e1	0.5 vol%	0.1 vol%

*The existing method calls for measuring the properties in the denaturant, rather than in the denatured ethanol, and multiplying by a dilution factor.

The test methods proposed for analyzing benzene, aromatic hydrocarbons, and olefins in denatured ethanol would be an additional option for determining compliance with the regulatory limits. Ethanol producers and other stakeholders could still determine compliance by analyzing the pure denaturant. Staff proposes to retain the old method of testing the denaturant and multiplying by a dilution factor, because the old method is cheaper and is adequate as a screening tool. However, in the event of any discrepancy between results obtained by analyzing the denatured ethanol and analyzing the denaturant, the results obtained by analyzing the denatured ethanol using the proposed new test methods would take precedence. This is because direct analysis of these compounds in denatured ethanol does not have the additional uncertainties and errors associated with analysis of the denaturant, such as the uncertainty of the concentrations of benzene, aromatic hydrocarbons, and olefins in the pure ethanol; error in the actual dilution; and uncertainty in contamination during the blending, storage, and transportation of the denatured ethanol.

B. Technical Aspects of Proposed New Test Methods

ASTM method D7754-11 employs gas chromatography (GC) with flame ionization detection (FID), referred to as GC/FID. In gas chromatography, the mobile phase (or "moving phase") is a carrier gas, usually an inert or unreactive gas. The stationary phase is a microscopic layer of liquid or polymer on an inert solid support, inside a piece of glass or metal tubing called a column. The instrument used to

perform gas chromatography is called a gas chromatograph (GC); a schematic is provided in Figure 1. The compounds being analyzed interact with the walls of the column, which is coated with a stationary phase. This causes each compound to elute at a different time, known as the retention time of the compound. The comparison of retention times, as well as the size of the peaks displayed by the FID, allows the analyst to determine the identity and concentration of the compound.

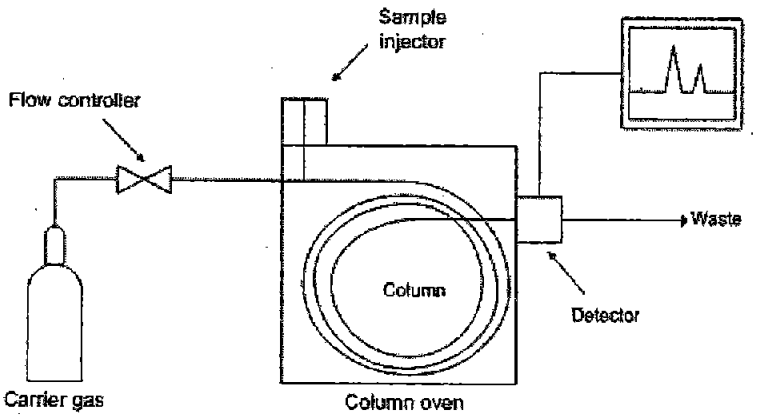

Figure 1: Schematic of a Generic GC. Source: Wikipedia, accessed Nov. 2012.

The instrument used for the currently adopted method for measuring MTBE and other prohibited oxygenates, ASTM D4815-04, can be modified with new columns to run the proposed ASTM D7754-11 method. The remainder of the GC/FID needs no further modifications.

ASTM method D7576-10 is also a GC/FID method. It uses exactly the same instrumentation as the currently adopted method for measuring benzene and total aromatic hydrocarbons in gasoline, ASTM method D5580-00.

ASTM method D7347-07e1 employs supercritical fluid chromatography with FID. The instrument used for the currently adopted method for measuring olefins in gasoline, ASTM method D6550-00, can be modified with the addition of a column to run ASTM method D7347-07e1.

C. Test Method Updates

Staff is also proposing to update several existing test methods to their most recent available versions. The proposed changes are listed in Table 3.

Table 3: Proposed Test Method Updates

Fuel Property	Existing Method	Proposed Method	Changes
Gasoline olefins	D6550-00	D6550-10	ARB-specific information
Gasoline aromatic hydrocarbons	D5580-00	D5580-02(2007)	Precision statement
Gasoline ethanol	D4815-04	D4815-09	Errors corrected
Diesel aromatic hydrocarbons	D5186-96	D5186-03(2009)	Streamlined QC

An appendix within test method ASTM D6550-10 includes ARB-specific information. When the Board adopted ASTM method D6550-00 for measuring olefins in gasoline, it included extra information concerning precision, sensitivity, and mass-volume percent correlation in the CaRFG regulation. The current version, ASTM method D6550-10, has this information included as an aid to its users. Therefore, adoption of the updated version will aid users by providing a single source of relevant information.

ASTM D5580-02(2007) has a newer precision statement than the one currently specified in the CaRFG regulations, which came from an earlier version of the method. The precision of a test method is used by ARB's Enforcement Division as the tolerance applied to ARB's and only ARB's analytical results when determining whether a fuel complies with the CaRFG and CDF regulations. Adoption of the updated version will acknowledge the precision of the test method and aid ARB's enforcement.

The new precision statement is based on an improved analysis of the same inter-laboratory study data used to generate the currently adopted precision statement. The measure of precision that is of interest to ARB is the reproducibility, which is the 95 percent confidence interval for identical samples analyzed in different laboratories. For both benzene and total aromatic hydrocarbons, the new statement provides a tighter reproducibility at some concentrations and a looser reproducibility at others. In all cases relevant to CaRFG, the difference between the old precision statement and the new one is small and is not expected to significantly impact the number of violations found by ARB. This issue has been discussed on multiple occasions with WSPA, ARB's Enforcement Division, and other stakeholders who have not raised any objections to the change. A comparison is provided in Table 4.

Table 4: ASTM D5580 Reproducibility Comparison

Property	Current Reproducibility	D5580-02(2007) Reproducibility	New Reproducibility Tighter	New Reproducibility Looser
Benzene	0.1409(X)^1.133 vol%	0.1087(X)^0.64 vol%	>0.70 vol%	<0.50 vol%
Aromatic hydrocarbons	1.40 vol%	0.2619(Y)^0.5 vol%	<28.5 vol%	>28.5 vol%

X = volume percent benzene
Y = volume percent total aromatic hydrocarbons

ASTM D4815-09 corrects minor errors in the example chromatograms and oxygenate density values that exist in the -04 version. The changes are not expected to have any effect on analytical results, but are necessary to correct the errors.

ASTM D5186-03(2009) incorporates a streamlined quality control procedure compared to the -96 version. For laboratories which analyze a variety of different diesel fuels, the new version of the method will save 30-60 minutes of overhead time every day the method is run. Therefore, staff proposes this amendment to aid stakeholders in improving their efficiency and saving costs.

Section IV – Recommended Actions

Staff recommends that the Board amend sections 2262.9, 2263(b), and 2282, Title 13, CCR, with the new test methods indicated in Tables 1 and 2 and the updated test methods in Table 3. The text of the proposed amendments is set forth in Appendix A.

A. Amend section 2262.9 to specify direct testing of denatured ethanol for future analyses

Section 2262.9 currently calls for compliance with the benzene, total aromatic hydrocarbons, and olefin specifications in denatured ethanol to be determined by measuring the denaturant before it is added to the pure ethanol; the result is then multiplied by a dilution factor to indirectly determine the concentration of the analyte in denatured ethanol. ARB and downstream stakeholders do not have access to the denaturants used in the production of denatured ethanol sold in California. As a result, neither ARB nor gasoline blenders can check the denatured ethanol for compliance with these specifications.

Now that test methods capable of adequately measuring these chemical species in denatured ethanol are available, staff recommends that section 2262.9 be amended to allow direct testing of denatured ethanol as an alternative to analyzing the denaturant. Staff recommends the designation of ASTM method D7576-10 for the measurement of benzene and total aromatic hydrocarbons in denatured ethanol, and ASTM method D7347-07e1 for the measurement of olefins in denatured ethanol. In the event of any discrepancy between results obtained by analyzing the denatured ethanol using the new test methods and analyzing the denaturant alone as has been the case in previous practice, the results obtained by analyzing the denatured ethanol would take precedence.

At this time no test methods, other than those cited above, are known to adequately perform these analyses. The only alternative to the adoption of these methods is to leave the regulations as they currently stand, which will continue to preclude adequate, downstream testing for these compounds in denatured ethanol. The proper quantification of benzene, aromatic hydrocarbons, and olefins in denatured ethanol will assure air quality protection and effective enforcement of the CaRFG regulations.

B. Amend section 2263(b) to designate ASTM D7754-11 for the future analysis of MTBE and other prohibited oxygenates in California gasoline

Section 2263(b) currently calls for measuring prohibited oxygenates in California gasoline by ASTM D4815-04. The limit of quantification of this test method is 0.2 vol% for each individual oxygenate. However, ARB's fuel regulations have phased-down the MTBE limit in four steps from a limit of 0.60 vol% starting on December 31, 2003 (0.30 vol% starting on July 1, 2004, then 0.15 vol% starting on December 31, 2005) and finally 0.05 vol% starting on July 1, 2007. Additionally, the regulations contain a limit of 0.06 wt% for the total oxygen contribution from all other prohibited oxygenates. ASTM D4815-04 cannot meet this requirement unless all of the oxygen

is coming from a single prohibited compound. As a result, neither ARB nor other stakeholders can adequately determine whether a sample of gasoline meets the current regulatory requirements.

For future analyses, staff proposes to incorporate ASTM D7754-11, which has a limit of quantification of 0.005 vol% for each individual oxygenate. This will allow ARB and other stakeholders to verify compliance with Section 2262, by more precisely measuring MTBE and oxygenates, other than ethanol, in California gasoline.

No other test methods capable of performing this analysis have been published by a recognized testing standards developer. Preliminary work on two test methods employing different technologies has been presented previously at technical meetings of the ASTM Committee D02 on Petroleum Products. While these two methods appear to be capable of measuring oxygenates at sufficiently low levels, they both require instrumentation that is significantly more expensive and difficult to operate and therefore, there has been no further development of these methods by ASTM.

As a result, the only alternatives to adopting ASTM D7754-11 as the designated test method for measuring MTBE and other prohibited oxygenates are leaving the current method, ASTM D4815-04, in the regulation, or replacing it with its latest version, ASTM D4815-09. However, the -09 version has the same limit of quantification as the -04 version, so adequate determination of compliance with the CaRFG regulations would remain problematic. ARB has a strong interest in facilitating compliance with the prohibited oxygenates element of the CaRFG regulations, because, as we discovered with MTBE, certain compounds in gasoline may result in significant groundwater contamination due to leaking underground fuel tanks.

C. Amend section 2263(b) to designate ASTM D6550-10 for the future analysis of olefins in California gasoline

An appendix within ASTM D6550-10 contains California-specific information that is absent in the currently adopted version, ASTM D6550-00. This information is currently published in footnotes to the test methods table in section 2263(b). Having the information available in the test method is more convenient for users of the method, and no cost to stakeholders will result from the change. Therefore, staff proposes the use of ASTM D6550-10 for future analyses of olefins in California gasoline.

D. Amend section 2263(b) to designate ASTM D4815-09 for the future analysis of permitted oxygenates in California gasoline

ASTM D4815-09 corrects minor errors in the -04 version. While these errors do not directly affect the method's results, they could cause confusion for analysts learning the method. The new version will avoid this possible confusion at no cost to stakeholders. Therefore, staff proposes the use of ASTM D4815-09 for future analyses of the oxygen content in California gasoline.

E. Amend section 2263(b) to designate ASTM D5580-02(2007) for the future analysis of benzene and total aromatic hydrocarbons in California gasoline

ASTM D5580-02(2007) contains a different, and more appropriate, precision statement than what is present in the footnotes to the test methods table in section 2263(b). For any given gasoline sample, the precision calculated using -07 version may be tighter or looser than the precision calculated using the equations in section 2263(b). However, the differences are small, and for all of California gasoline blends as a whole, no significant difference in precision (and therefore enforceability) is expected. This issue has been discussed on multiple occasions with WSPA, ARB's Enforcement Division, and other stakeholders who have not raised any objections to the change. Having the precision statements available in the published test method is more convenient for users than having a separate statement as a footnote in the regulations, and no cost to stakeholders will result from the change. Therefore, staff proposes the use of ASTM D5580-02(2007) for future analyses of benzene and total aromatic hydrocarbons in California gasoline.

F. Amend Section 2263(b) to remove ASTM D2622-94 for the future analysis of sulfur in California gasoline

Section 2263(b) currently specifies both ASTM D2622-94 and ASTM D5453-93 for the measurement of sulfur in California gasoline. However, ASTM D2622-94 has a limit of quantification of 10 ppm sulfur, which is higher than the levels currently observed in most California gasoline blends. On the other hand, ASTM D5453-93 is more sensitive, and therefore, more appropriate for lower levels of sulfur in gasoline. Recent discussions with WSPA indicated that no California refiner is using ASTM D2622-94 in the production of fuel for use in California. Therefore, no costs to stakeholders are expected from this change. Therefore, staff proposes the removal of ASTM D2622-94 for future analyses of sulfur in California gasoline.

G. Amend section 2282 to designate ASTM D5186-03(2009) for the future analysis of aromatic hydrocarbons and polycyclic aromatic hydrocarbons in California diesel fuel

The QC section of ASTM D5186-96 requires that laboratories which analyze a wide variety of diesel fuels run several different QC samples each day. Studies conducted by ASTM Committee D02 determined that this requirement is excessive, so ASTM D5186-03(2009) requires only a single QC sample each day. ARB staff is in agreement with the change. There are no other significant changes to the test method in the 2009 version. Adoption of the new version will save time and money for laboratories which are able to reduce their QC analyses, and will have no cost for other stakeholders. Therefore, staff proposes the use of ASTM D5186-03(2009) for future analyses of aromatic hydrocarbons and polycyclic aromatic hydrocarbons in California diesel fuel.

Section V – Alternatives to the Proposed Amendments

ARB staff considered potential alternatives to each of the proposed amendments. They are discussed in more detail below.

A. Analysis of Denatured Ethanol in California Gasoline

ARB staff considered the no action alternative to the proposed amendment for analysis of denatured ethanol in California gasoline. The proposed amendment provides for the direct analysis of benzene, total aromatic hydrocarbons, and olefins in denatured ethanol. The current CaRFG regulations specify indirect measurement of these compounds in the denaturant prior to its addition to the pure ethanol, followed by application of a dilution factor. ARB staff has concluded that the proposed amendments are more appropriate than the no action alternative because:

- ARB and downstream stakeholders do not have access to the denaturants used in the production of denatured ethanol sold in California, because the denaturant is typically added to ethanol outside of California.

- ARB and gasoline blenders can't directly check the denatured ethanol for compliance with these specifications.

- Direct analysis of benzene, aromatic hydrocarbons, and olefins in denatured ethanol does not have the additional uncertainties and errors associated with analysis of the denaturant, such as the uncertainty of the concentrations of these compounds in the pure ethanol; error in the actual dilution; and uncertainty in contamination during the blending, storage, and transportation of the denatured ethanol.

B. Analysis of MTBE and other Prohibited Oxygenates in California Gasoline

ARB staff considered two alternatives to the proposed amendment: the no action alternative and updating the current test method with its latest version, ASTM D4815-09. ARB staff has concluded that the proposed amendments are more appropriate than the no action alternative, because the current test method does not have a sufficiently low limit of quantification to adequately measure down to the regulatory limit. ARB staff also concluded that amending the regulations to the updated version, ASTM D4815-09, is also not appropriate, because the updated version has the same limit of quantification as the current version of ASTM D4815. Therefore, the proposed amendments are more appropriate than the alternatives, because the amendments will allow ARB and other stakeholders to verify compliance with Section 2262, by more precisely measuring MTBE and oxygenates, other than ethanol, in California gasoline.

C. California-Specific Information for Testing Olefins in California Gasoline

ARB staff considered the no action alternative to the proposed amendment for the California-specific information for testing olefins in California gasoline. ARB staff has concluded that the proposed amendments are more appropriate than the no action

alternative because the proposed amendments adopt the updated test method, which consolidates the California-specific information into the test method. Therefore, the proposed amendments eliminate the need to rely on two documents to properly calculate the olefin content, thereby minimizing the inconvenience and confusion to the analyst.

D. Analysis of Permitted Oxygenates in California Gasoline

ARB staff considered the no action alternative to the proposed amendment for the analysis of permitted oxygenates in California gasoline. However, the proposed amendments are more appropriate than the no action alternative, which would retain the existing ASTM D4815-04 and which includes minor errors that could cause confusion for analysts learning the method.

E. Analysis of Benzene and Aromatic Hydrocarbons in California Gasoline

ARB staff considered the no action alternative to the proposed amendment for the analysis of benzene and aromatic hydrocarbons in California gasoline. However, the proposed amendments are more appropriate than the no action alternative, because the formulas to determine reproducibility of benzene and total aromatic hydrocarbons that are given in the footnotes to the regulation are no longer appropriate. The correct formulas are given in the updated test method, ASTM D5580-02(2007). Therefore the proposed amendments eliminate the need to rely on two documents to properly calculate the benzene and aromatic hydrocarbon content, thereby minimizing the inconvenience and confusion to the analyst.

F. Analysis of Sulfur in California Gasoline

ARB staff considered the no action alternative to the proposed amendment for the analysis of sulfur in California gasoline. ARB staff has concluded that the proposed amendments are more appropriate than the no action alternative, because one of the current test methods, ASTM D2622-94, does not have a sufficiently low limit of quantification to adequately measure sulfur at levels currently observed in most California gasoline blends.

G. Analysis of Aromatic Hydrocarbons and Polycyclic Aromatic Hydrocarbons in California Diesel Fuel

ARB staff considered the no action alternative to the proposed amendment for the analysis of aromatic hydrocarbons and polycyclic aromatic hydrocarbons in California diesel fuel. ARB staff has concluded that the proposed amendments are more appropriate than the no action alternative, because the proposed amendments allow the analyst to run only one QC sample each day, as opposed to multiple and unnecessary QC samples each day, thereby saving time and materials for the analyst.

H. Reasonable Alternatives that would Lessen the Impact on Small Business

ARB staff has also considered the potential alternatives to the proposed amendments that would lessen any adverse impact on small business (namely, those alternatives discussed above). However, as discussed above, the proposed amendments are more appropriate than the no action alternative for the reasons provided above. In addition, because analytical testing of the CaRFG or CDF is not required by the regulations, no small business is obligated to conduct fuel testing.

Section VI – Environmental Impact Analysis

A. Introduction

This chapter provides an environmental analysis for the proposed regulation. Staff has determined that implementation of the proposed new and updated test methods for the analysis of CaRFG3, denatured ethanol, and diesel fuel would not result in any potentially significant adverse impacts on the environment. This analysis provides the basis for reaching this conclusion.

B. Environmental Review Process (CEQA)

ARB is the lead agency for the proposed regulation and has prepared this environmental analysis pursuant to its regulatory program certified by the Secretary of the Natural Resources Agency (14 CCR 15251(d); 17 CCR 60005-60007). In accordance with Public Resources Code section 21080.5 of the California Environmental Quality Act (CEQA), public agencies with certified regulatory programs are exempt from the requirements for preparing environmental impact reports, negative declarations, and initial studies (14 CCR 15250). As required by ARB's certified regulatory program, and the policy and substantive requirements of CEQA, ARB has prepared, as part of this staff report, an assessment of the potential for significant adverse and beneficial environmental impacts associated with the proposed regulation and a succinct analysis of those impacts (17 CCR 60005(b)). The resource areas from the CEQA Guidelines Environmental Checklist were used as a framework for assessing the potential for significant impacts (17 CCR 60005(b)).

If comments received during the public review period raise significant environmental issues, staff will summarize and respond to the comments in writing. The written responses will be included in the Final Statement of Reasons for the regulation. Prior to taking final action on any proposed action for which significant environmental issues have been raised, the decision maker shall approve the written responses to these issues (17 CCR 60007(a)). If the regulation is adopted, a Notice of Decision will be posted on ARB's website and filed with the Secretary of the Natural Resources Agency for public inspection (17 CCR 60007(b)).

C. Proposed Regulations

1. Description

   The proposed amendments are described in detail in Section III of this Staff Report. Briefly, the proposed amendments include the following changes:

   - Replace one gasoline test method which isn't sufficiently sensitive with a new one;
   - Add two test methods for determining whether denatured ethanol complies with existing regulations;
   - Update four existing test methods to current versions; and

- Remove one obsolete test method for future analyses.

2. Methods of Compliance

The use of ARB's proposed fuel test method amendments is voluntary, because the CaRFG and CDF regulations do not require stakeholders to test their fuels. The proposed fuel test method amendments are previously discussed in detail in Section III. If the regulated community opts to test their California gasoline using ARB's proposed, specified methods, they may need to upgrade existing, or purchase new, fuel test equipment as described previously in Section III in order to comply with the new gasoline test methods. No equipment upgrades would be required for the methods being updated to current versions.

The use of the new methods to analyze denatured ethanol would be entirely optional, because the CaRFG regulations do not require stakeholders to test the denatured ethanol or denaturant; the regulated community could continue to use existing procedures for determining compliance with the denatured ethanol specifications. However, in the event of any discrepancy between results obtained by analyzing the denatured ethanol and analyzing the denaturant, the results obtained by analyzing the denatured ethanol would take precedence.

D. Environmental Impacts

1. Beneficial Impacts

The proposed test procedures are designed to ensure that fuels sold within California meet specified standards. There are no emissions reductions associated with the proposed amendments, because the proposed amendments merely change the test procedures; they do not change the specifications of the fuels.

2. Resource Areas with No Impacts

Based on ARB's review of the proposed regulatory amendments, staff concludes that the amendments would not have a significant adverse effect on the environment. Compliance with the proposed amendments would not result in any physical change to the existing environment because the amendments affect only the test methods used to determine whether fuels comply with the applicable regulations. Thus, the amendments would not involve or result in any physical changes to the existing environment, such as new development, modifications to existing buildings or facilities, or new land use designations. Further, since compliance with the proposed amendments would be related only to test methods that are voluntary, the amendments would not involve any activity that would entail or affect aesthetics, air quality, agricultural and forestry resources, biological resources, cultural resources, geology and soils, greenhouse gases, hazardous material, hydrology and water quality, land use planning, mineral resources, noise, population and

housing, public services, recreation, or traffic and transportation. The proposed amendments would not require any action by regulated parties that could affect these resources.

Impact on the State Implementation Plan (SIP)

ARB's 2007 SIP proposal is a comprehensive strategy designed to attain federal air quality standards as quickly as possible through a combination of technologically feasible, cost-effective, and far reaching measures. The total magnitude of the reductions to be achieved through new actions is primarily driven by the scope of the air quality problems in the San Joaquin Valley and South Coast Air Basin. These proposed amendments would not have any impact on the SIP, because the proposed amendments merely change the test procedures for fuel analysis.

No discussion of alternatives or mitigation measures to address significant adverse environmental impacts is necessary because no significant adverse environmental impacts would result from implementation of the proposed amendments. This is because the proposed amendments merely change the test procedures for fuel analysis, without changing any gasoline or diesel ingredient.

Section VII – Environmental Justice

ARB 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 ARB to ensure that full protection is afforded to all Californians. The proposed amendments are not expected to have an effect on community health, because they merely change the test procedures for fuel analysis.

Section VIII - Economic and Fiscal Impacts

In this section, staff provides estimates of the costs to businesses who voluntarily choose to follow the proposed amendments. The amendments could directly apply to approximately 100 businesses in the state. The affected businesses include refineries producing gasoline and diesel fuel for sale in California, distribution terminals, ethanol producers, and producers and importers of denatured ethanol for gasoline blending.

A. Effects of the Proposed Amendments

1. Cost of allowing direct testing of denatured ethanol

Staff's proposal provides the option of directly testing denatured ethanol for olefin, benzene, and total aromatic hydrocarbon content as an alternative to testing of the denaturant before it is blended into ethanol. (Note, however, as previously discussed in the event of any discrepancy between results obtained by analyzing the denatured ethanol and analyzing the denaturant, the results obtained by analyzing the denatured ethanol would take precedence.) Discussions with major terminal operators in California indicated that they currently rely on certifications provided by the producers of the denatured ethanol they use and will likely continue to do so, rather than implementing the new optional test methods. An interview with a representative of the ethanol industry indicated that ethanol producers do not intend to change their current procedures for complying with the specification involved. From these discussions, staff does not anticipate any economic impact on the affected industries. If all terminals and ethanol producers were to voluntarily purchase instrumentation to run the new test methods, in contrast to Staff's expectations, the cost would be approximately $120,000 per facility.

2. Cost of designating ASTM D7754-11 for the analysis of MTBE and other prohibited oxygenates in California gasoline

Staff's proposal would change the designated test method for measuring MTBE and other prohibited oxygenates in gasoline from ASTM D4815-04 to ASTM D7754-11. While the use of the designated test method is not required by regulation, discussions with WSPA indicated that refinery operators in California are very likely to use the new method. Discussions with terminal operators in California indicated that they do not currently use ASTM D4815-04 and are not planning to use ASTM D7754-11.

The discussions with WSPA suggest that each refinery will likely use a single instrument to run ASTM D7754-11, which could be purchased new or obtained by upgrading an existing ASTM D4815-04 instrument. Upgrading an existing ASTM D4815-04 instrument to run ASTM D7754-11 would simply involve a change in the column, with no further modifications required of the remainder of the GC/FID. Purchasing a new instrument to run ASTM D7754-11 would be more expensive than upgrading an existing instrument. For

purposes of this economic analysis, staff assumes that each refinery will purchase a new instrument.

Pricing data obtained by staff from the manufacturer of the ASTM D7754-11 equipment indicate that a new instrument will cost approximately $60,000. Operation and maintenance costs are typically estimated at 10 percent of an instrument's cost ($6,000 in this case) per year. Over a five year period, the present cash value of the operation and maintenance costs would be $26,000.

The new instruments are expected to cost the refining industry approximately $1.2 million over a five year period (14 refineries X ($60,000 initial cost + $26,000 for five years' maintenance.)) Approximately 13 billion gallons of CARFG are produced annually by California refiners, making the cost of the new instruments 0.002 cents per gallon over five years. This cost increase is not expected to have a significant impact on the profitability of California refiners. As a result, staff expects no significant change in employment, business competitiveness, or the status of businesses in California due to the change of test methods.

From information obtained during interviews, staff does not expect terminal operators to purchase instrumentation for running ASTM D7754-11. Terminals do not currently test for trace prohibited oxygenates, and are not expected to begin doing so. In the most conservative scenario, if all terminal operators were to change their plans and decide to test per the staff's proposal, the additional cost to the industry to purchase the instrumentation to run ASTM D7754-11 would be approximately $6.5 million (75 terminals x ($60,000 + $26,000)) over five years, for a total cost of $7.7 million. The cost of the new instruments for all facilities would translate to 0.012 cents per gallon over five years.

3. Cost of Updating ASTM D4815, D5580, and D6550 to Newer Versions and Removing ASTM D2622-94 for future analyses

   Staff's proposal to update existing test methods to newer versions for oxygen, benzene, aromatic hydrocarbons, and olefin content and to remove the obsolete method ASTM D2622-94 for future analyses of sulfur is not expected to have any significant impact on the operations of any business in California. As a result, staff expects no economic impact on the affected industries.

B. Costs to Produce CARFG and CDF

No impacts to the cost to produce CaRFG or CDF are expected, because the proposed amendments merely change the test methods for conducting fuel analysis; they do not change the specifications of CaRFG or CDF or add or remove any ingredient from gasoline or diesel fuel.

C. Creation or Elimination of Jobs within the State

No impacts to the creation or elimination of jobs within the state are anticipated because the proposed amendments merely change the test procedures for conducting fuel analysis; they do not change the specifications for CaRFG or CDF and are not expected to increase the production costs. A few jobs could be created at terminals if these facilities were to decide to run the new test methods. However, interviews with terminal operators have suggested that this is unlikely.

D. Creation of New Businesses or the Elimination of Existing Businesses within the State

No impacts to the creation of new business or elimination of existing businesses within the state are anticipated because the proposed amendments merely change the fuel test procedures; they do not change the specifications for CaRFG or CDF and are not expected to increase the production costs.

E. Competitive Advantages or Disadvantages for Businesses Currently Doing Business within the State

No impacts to the competitive advantages or disadvantages for businesses currently doing business within the state are anticipated because the proposed amendments merely change the fuel test procedures; they do not change the specifications for CaRFG or CDF and are not expected to increase the production costs.

F. Increase or Decrease of Investment in the State

No impacts to the increase or decrease of investment in the state are anticipated because the proposed amendments merely change the fuel test procedures; they do not change the specifications for CaRFG or CDF and are not expected to increase the production costs.

G. Incentives for Innovation in Products, Materials, or Processes

As the proposed amendments change the specifications for CaRFG or CDF by implementing more precise and sensitive test methods, minimal incentives to innovation in products, materials, or processes may be experienced.

H. Impact on Government Revenue

No impact on government revenue is expected as a result of the amendments because gasoline and diesel fuel sales and costs will remain unimpacted by the staff's proposal.

I. Impact on Small Refiners

No additional costs to produce CaRFG or CDF are expected as a result of the amendments for small refiners, because no changes in fuel formulations or production are expected.

J. Small Business Economic Effect

Government Code sections 11342 et. seq. require ARB to consider any adverse effects on small businesses that would have to comply with a proposed regulation. In defining small business, Government Code section 11342 explicitly excludes refiners from the definition of "small business." Also, the definition includes only businesses that are independently owned and, if in retail trade, gross less than $2,000,000 per year. Thus, our analysis of the economic effects on small business is limited to the costs to gasoline and diesel retailers and jobbers, retailers, and gasoline and diesel fuel end-users. A jobber is an individual or business that purchases wholesale gasoline and delivers and sells it for profit to another party, usually a retailer or other end-user.

1. Jobbers and Retailers

   No economic impact is expected to affect jobbers and retailers as a result of the amendments because they do not certify fuel formulations for sale. Furthermore, these amendments would not change production costs or volumes, so fuel prices and supplies should remain unchanged.

2. Gasoline and Diesel Fuel End-Users

   No economic impact is expected to affect jobbers and retailers as a result of the amendments because fuel prices and supplies should remain unchanged.

K. Fiscal Impacts

1. Impact on Government Revenue

   No impact on government revenue is expected as a result of the amendments because gasoline and diesel fuel sales and costs will remain unchanged.

2. Impact on Government Expenditures

   No impact on government entities as fuel end-users is expected as a result of the amendments because gasoline and diesel fuel sales and costs will remain unchanged.

   There will be no additional person-years needed to enforce the amendments because the amendments do not add additional enforcement requirements above what is already currently being enforced.

L. Reasonable Alternatives to the Amendments

ARB staff considered potential alternatives to the proposed amendments (namely, the no action alternative in most cases and updates to existing test methods). ARB staff determined the proposed amendments are more appropriate than the alternatives considered. The proposed amendments include improved test methods

that provide better sensitivity and reduce the number of QC samples necessary to conduct fuel analysis.

No alternative considered by the agency would be more effective in carrying out the purpose for which the regulation is proposed or would be as effective as or less burdensome to affected private persons than the proposed regulation.

M. Description of Reasonable Alternatives Considered that would Lessen Impact on Small Business

ARB staff has also considered the potential alternatives to the proposed amendments that would lessen any adverse impact on small business. However, as discussed above, the proposed amendments are more appropriate than the alternatives considered.

N. Evidence relied upon to support initial determination in the notice that the regulation will not have a significant adverse economic impact on business

While CaRFG and CDF regulations do not require refiners or terminal operators to test their fuel, discussions with WSPA have indicated that each gasoline refinery in California is likely to purchase one instrument for running ASTM D7754-11.

Staff contacted the manufacturer of the ASTM D7754-11 equipment, who indicated that a new instrument will cost approximately $60,000. Assuming operation and maintenance costs of 10% of an instrument's cost each year, staff assumes the present cash value of the operation and maintenance costs would be $26,000. The new instruments are expected to cost the refining industry approximately $1.2 million over a five year period (14 refineries X ($60,000 initial cost + $26,000 for five years' maintenance.)) Approximately 13 billion gallons of CaRFG are produced annually by California refiners, making the cost of the new instruments 0.002 cents per gallon over five years.

From information obtained during interviews, staff does not expect terminal operators to purchase instrumentation for running ASTM D7754-11. Terminals do not currently test for trace prohibited oxygenates, and are not expected to begin doing so. As a worst-case scenario, if all terminal operators were to purchase the instrumentation to run ASTM D7754-11, the additional cost to the industry would be approximately $6.5 million (75 terminals x ($60,000 + $26,000)) over five years, for a total cost of $7.7 million. The cost of the new instruments for all facilities would be 0.012 cents per gallon over five years.

O. Justification for adoption of regulations different from federal regulations contained in the Code of Federal Regulations

The Federal Reformulated Gasoline (RFG) regulations apply to about 80 percent of California's gasoline and are set forth in Code of Federal Regulations (CFR), title 40, part 80, section 40 et seq. CaRFG regulations apply to all gasoline sold, supplied, or offered in California. All CaRFG meets or exceeds the requirements of the federal RFG regulations, resulting in significant additional emission reductions and

corresponding improvements in air quality. Under 40 CFR § 80.81, gasoline meeting the CaRFG3 standards is exempt from several of the enforcement requirements of the federal RFG regulations. Differing state regulations are not only authorized by law, but any cost of the differing state regulations is justified by the benefit to human health, public safety, public welfare, or the environment. However, as these proposed amendments merely change the fuel test procedures, no additional impact to human health, public safety, public welfare, or the environment is anticipated. The amendments are necessary to implement the most precise and efficient test methods to determine compliance with the CARFG and CDR regulations.

P. Benefits of the regulation to the health and welfare of California residents, worker safety, and the state's environment

The proposed test procedures are designed to ensure that fuels sold within California meet specified standards. However the test procedures themselves do not generate additional emissions reductions.

Indirect, beneficial environmental impacts may result by amending section 2282 to designate ASTM D5186-03(2009) for the analysis of aromatic hydrocarbons and polycyclic aromatic hydrocarbons in diesel fuel. This is because the current method, ASTM D5186-96, which requires laboratories that analyze a wide variety of diesel fuels, requires the laboratories run several different QC samples each day. The proposed amendment to use ASTM D5186-03(2009) requires only a single QC sample each day. Therefore, use of the newer test method will reduce environmental impacts associated with the production, transportation, use, and disposal of materials used to run the additional QC samples.

As the proposed amendments merely change or update the test methods that are specified in CaRFG and CDF regulations, no direct impacts to the health, safety, and welfare of California residents, worker safety, or the state's environment and quality of life are anticipated.

Section IX – Summary and Rationale for Proposed Regulations and Staff Recommendation

The proposed amendments would provide the option of direct testing of chemical properties of denatured ethanol, and would change or update certain test methods used in the analysis of California gasoline and diesel fuel.

A. Section 2262.9(b) – Denatured Ethanol Test Methods

Summary of Proposed Amendment

This amendment adds an option for directly measuring the concentrations of benzene, total aromatic hydrocarbons, and olefins in denatured ethanol.

Rationale for Proposed Amendment

CaRFG regulations currently call for determining these chemical properties of denatured ethanol by measuring them in the denaturant before it is blended into the ethanol, and then multiplying the result by a dilution factor. ARB and many downstream California gasoline blenders do not have access to the denaturant, since it is blended into the ethanol before the resulting denatured ethanol is shipped to California. As a result, determining whether a sample of denatured ethanol complies with the regulations is problematic for ARB and the downstream California gasoline blenders.

The proposed amendment adds an option to use newly developed test methods, for future analyses, to measure these chemical properties directly, enabling downstream enforcement of ARB's regulations. In the event of any discrepancy between results obtained by analyzing the denatured ethanol and analyzing the denaturant, the results obtained by analyzing the denatured ethanol would take precedence. This is because direct analysis of benzene, aromatic hydrocarbons, and olefins in denatured ethanol does not have the additional uncertainties and errors associated with analysis of the denaturant, such as the uncertainty of the concentrations of these compounds in the pure ethanol; error in the actual dilution; and uncertainty in contamination during the blending, storage, and transportation of the denatured ethanol. Clarification is included in the regulations to ensure that if a regulated party determines the denatured ethanol is compliant based on analysis of the denaturant and ARB determines it is non-compliant based on analysis of the denatured ethanol, ARB may take enforcement action.

B. Section 2263(b) – Gasoline Test Methods

Summary of Proposed Amendment

This amendment changes the test method for MTBE and other prohibited oxygenates to ASTM D7754-11. It also updates methods ASTM D4815-04, D5580-00, and D6550-00 to their most recent published versions, and removes ASTM D2622-94 for future analyses.

Rationale for Proposed Amendment

The fuel regulations currently specify ASTM method D4815-04 for measuring MTBE and other prohibited oxygenates. ARB's fuels regulations have phased-down the MTBE limit in four steps from a limit of 0.60 vol% starting on December 31, 2003 (0.30 vol% starting on July 1, 2004, then 0.15 vol% starting on December 31, 2005) and finally 0.05 vol% starting on July 1, 2007. Additionally, the maximum oxygen content from other prohibited oxygenates is 0.06 wt%. However, ASTM D4815-04 is not sensitive enough to adequately measure these concentrations. ASTM D7754-11 is sufficiently sensitive and will enable enforcement of the regulation of prohibited oxygenates. Therefore, staff proposes the use of ASTM D7754-11 for all future analyses for MTBE and other prohibited oxygenates.

ASTM D4815-04, D5580-00, and D6550-00 are the test methods designated for measuring ethanol, aromatic hydrocarbons, and olefins in gasoline, respectively. Newer versions of these methods are available. These newer versions correct errors, provide improved precision statements, and offer additional information of use to users of the methods. Therefore, staff proposes the use of these newer versions of the test methods for all future analyses.

Method ASTM D2622-94 is one of two test methods designated for measuring sulfur in gasoline. It is not sufficiently sensitive for the analysis of California gasoline blends. Elimination of this method for future analyses will prevent potential confusion concerning its applicability.

C. Section 2282 – Diesel Fuel Test Methods

Summary of Proposed Amendment

This amendment updates ASTM D5186-96, the test method designated for measuring total aromatic hydrocarbons and polycyclic aromatic hydrocarbons in diesel fuel to its most recently published version.

Rationale for Proposed Amendment

The most recently published version of the diesel aromatic hydrocarbons test method, ASTM D5186-03(2009), contains streamlined QC procedures. The new procedures allow laboratories that analyze a wide variety of diesel fuels to run a single quality control sample, rather than the several samples called for in the -96 version. Recent evidence suggests that multiple QC samples are unnecessary. This change, applicable to future analyses, will allow laboratories to save up to an hour each day in which samples are analyzed without jeopardizing the quality of the test results.

D. Staff Recommendation

For the reasons stated above, staff recommends the Board adopt the amendments to the gasoline and diesel fuel test methods, as described in this staff report.

Section X – Documents Incorporated by Reference

ASTM (2009), Standard Test Method for Determination of MTBE, ETBE, TAME, DIPE, tertiary-Amyl Alcohol and C_1 to C_4 Alcohols in Gasoline by Gas Chromatography, in *Annual Book of ASTM Standards*, Method D4815-09, ASTM International, West Conshohocken, Pennsylvania, 2009.

ASTM (2009), Standard Test Method for Determination of Aromatic Content and Polynuclear Aromatic Content of Diesel Fuels and Aviation Turbine Fuels by Supercritical Fluid Chromatography, in *Annual Book of ASTM Standards*, method D5186-03(2009), ASTM International, West Conshohocken, Pennsylvania, 2003, reapproved without change, 2009.

ASTM (2007), Standard Test Method for Determination of Benzene, Toluene, Ethylbenzene, p/m Xylene, o Xylene, C9 and Heavier Aromatics, and Total Aromatics in Finished Gasoline by Gas Chromatography, in *Annual Book of ASTM Standards,* method D5580-02(2007) , ASTM International, West Conshohocken, Pennsylvania, 2002, reapproved without change, 2007.

ASTM (2010), Standard Test Method for Determination of Olefin Content of Gasolines by Supercritical Fluid Chromatography, in *Annual Book of ASTM Standards*, method D6550-10, ASTM International, West Conshohocken, Pennsylvania, 2010.

ASTM (2007), Standard Test Method for Determination of Olefin Content in Denatured Ethanol by Supercritical Fluid Chromatography, in *Annual Book of ASTM Standards*, method D7347-07e1, ASTM International, West Conshohocken, Pennsylvania, 2007.

ASTM (2010), Standard Test Method for Determination of Benzene and Total Aromatics in Denatured Fuel Ethanol by Gas Chromatography, in *Annual Book of ASTM Standards*, method D7576-10, ASTM International, West Conshohocken, Pennsylvania, 2010.

ASTM (2011), Standard Test Method for Determination of Trace Oxygenates in Automotive Spark Ignition Engine Fuel by Multidimensional Gas Chromatography, in *Annual Book of ASTM Standards*, method D7754-11, ASTM International, West Conshohocken, Pennsylvania, 2011.

Appendix A

Proposed 2013 Amendments to the Regulations for Gasoline and Diesel Fuel Test Methods

PROPOSED REGULATION ORDER

PROPOSED 2012 AMENDMENTS TO THE REGULATIONS FOR GASOLINE AND DIESEL FUEL TEST METHODS

Note: The proposed amendments are shown in underline to indicate additions and ~~strikeout~~ to Indicate deletions, compared to the preexisting regulatory language. The symbol "* * * * *" means that intervening text not being amended is not shown. Subsection headings are shown in ***bold italics*** and are to be italicized in Barclays California Code of Regulations.

Amend Sections 2262.9, 2263, and 2282, Title 13, California Code of Regulations (CCR) to read:

California Code of Regulations, Title 13, Division 3
Chapter 5. Standards for Motor Vehicle Fuels
Article 1. Standards for Gasoline
Subarticle 2. Standards for Gasoline Sold Beginning March 1, 1996

§ 2262.9. Requirements Regarding Denatured Ethanol Intended For Use as a Blend Component in California Gasoline.

* * * * *

(b) Test Methods

(1) In determining compliance with the denatured ethanol standards in section (a)(1)(A):

* * * * *

(C) Starting [**insert effective date**], the aromatic hydrocarbon and benzene content of denatured ethanol shall be determined by ASTM D7576-10, which is incorporated herein by reference. Starting [**insert effective date**], the olefin content of denatured ethanol shall be determined by ASTM D7347-07e1, which is incorporated herein by reference.

(D) In the event of any discrepancy between results obtained by using sections 2262.9 (b)(1)(B) and 2262.9 (b)(1)(C), the results obtained by using section 2262.9 (b)(1)(C) shall take precedence.

* * * * *

Note: Authority cited: Sections 39600, 39601, 43013, 43013.1, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018, 43101 and 43830.8, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

§ 2263. Sampling Procedures and Test Methods.

* * * * *

(b) ***Test Methods.***

(1) In determining compliance with the gasoline standards set forth in this subarticle 2, including those in the sections identified in Table 1, the test methods presented in Table 1 shall be used. All identified test methods are incorporated herein by reference.

Table 1

Section	*Gasoline Specification*	*Test Method* [a]
* * * * *		
2262	Sulfur Content	ASTM D 2622-94 [c, d] or ASTM D 5453-93 (Through [**insert day before effective date**]) ASTM D 5453-93 (Starting [**insert effective date**])
2262	Benzene Content	ASTM D 5580-00 [e] (Through [**insert day before effective date**]) ASTM D 5580-02 (2007) (Starting [**insert effective date**])
2262	Olefin Content	ASTM D 1319-95a [f] (Through December 31, 2001) ASTM D 6550-00 [g,h,i] (Starting January 1, 2002 through [**insert day before effective date**]) ASTM D 6550-10 [k,l,m] (Starting [**insert effective date**])
2262	Oxygen Content	ASTM D 4815-04 (Through [**insert day before effective date**]) ASTM D 4815-09 (Starting [**insert effective date**])
* * * * *		
2262	Aromatic Hydrocarbon Content	ASTM D 5580-00 [j] (Through [**insert day before effective date**])

		ASTM D 5580-02 (2007) (Starting [**insert effective date**])
2262.5(b)	Ethanol Content	ASTM D 4815-04 (Through [**insert day before effective date**]) ASTM D 4815-09 (Starting [**insert effective date**])
2262.6	MTBE Content	ASTM D 4815-04 (Through [**insert day before effective date**]) ASTM D 7754-11 (Starting [**insert effective date**])
2262.6(c)	Oxygen from oxygenates identified in section 2262.6(c)(4)	ASTM D 4815-04 (Through [**insert day before effective date**]) ASTM D 7754-11 (Starting [**insert effective date**])

[a] Do not report values below the limit of detection (LOD) specified in the test method. Where a test method does not specify a LOD, do not report values below the lower limit of the scope of the test method.

[b] Delete paragraph 4(b) concerning sampling.

[c] Make the following modifications to paragraph 9.1:

Low Level Sulfur Calibration Procedure

Reagents Thiophene, at least 99% purity 2-Methylthiophene, at least 98% purity Toluene, reagent grade 2,2,4-Trimethylpentane, reagent grade

Preparation of Stock Standard Weigh standard materials thiophene (~ 0.7290 gm) and 2-methylthiophene (~ 0.7031 gm) separately into a tared volumetric flask and record the individual mass to 0.1 mg. Add "mixed solvent" containing 25% toluene and 75% iso-octane (by volume) into the flask to a net weight of approximately 50 gm and record the weight. This "Stock Standard" contains approximately 10 mg/gm sulfur. The actual sulfur concentration can be calculated as follows:

Sulfur from thiophene (gm) = Weight of thiophene *32.06* purity/84.14

Sulfur from 2-methylthiophene (gm) = Weight of 2-methylthiophene *32.06* purity/98.17

Sulfur concentration of Stock Standard (gm/gm) = (sulfur from thiophene + sulfur from 2-methylthiophene)/net weight of the stock standard

Multiply the sulfur concentration by 1000 to convert the unit to mg/gm.

Preparation of Calibration Standards Pipet 2.5 ml of the Stock Standard to 250 ml flask and dilute with the "mixed solvent" to the mark. The "Diluted Standard" contains approximately 100 mg/kg sulfur. Prepare 5, 10, 20, 30, 50, 75 ppm calibration standards by pipetting 5, 10, 20, 30, 50, 75 ml of the Diluted Standard into a 100 ml flask, respectively, and diluting with the "mixed solvent" to the mark. The actual concentration of the calibration standard should be determined from the stock standard. The standards with concentration ranging from 5 to 100 ppm and the "mixed solvent" are to be used for calibrating the instrument.

[d] Replace ASTM D 2622-94 reproducibility values with the following:

Sulfur Content, ppm	*Reproducibility*
10 to 30	40.5% x Sulfur Content (ppm)
>30	19.2% x Sulfur Content (ppm)

[e] The reproducibility of benzene is as follows:

Reproducibility = 0.1409 ($X^{1.133}$), where X = vol %

[f] Add the following reproducibility statement for oxygenate-containing samples:

	Range	*Reproducibility*
Olefins	0.3 - 33	$0.819(X)^{0.6}$

X = Volume %

[g] Replace ASTM D6550-00 reproducibility equation with the following:

Reproducibility = $0.32\ X^{0.5}$

where X is between 0.3 and 25 mass % olefin

[h] The conversion from mass % olefin to volume % olefin is defined as follows:

volume % olefin = 0.857 * mass % olefin

[i] Replace the last sentence in ASTM D6550-00 section 1.1 with the following:

The application range is from 0.3 to 25 mass % total olefins.

[j] The reproducibility of total aromatic hydrocarbon is as follows:

Reproducibility = 1.4 volume%

[k] Replace ASTM D6550-10 reproducibility equation with the following:

Reproducibility = $0.32\ X^{0.5}$

where X is between 0.3 and 25 mass % olefin

[l] The conversion from mass % olefin to volume % olefin is defined as follows:

volume % olefin = 0.857 * mass % olefin

[m] Replace the last sentence in ASTM D6550-10 section 1.1 with the following:

The application range is from 0.3 to 25 mass % total olefins.

* * * * *

Note: Authority cited: Sections 39600, 39601, 43013, 43013.1, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1, 43016, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal.3d 411, 121 Cal. Rptr. 249 (1975).

California Code of Regulations, Title 13, Division 3
Chapter 5. Standards for Motor Vehicle Fuels
Article 2. Standards for Diesel Fuel

§ 2282. Aromatic Hydrocarbon Content of Diesel Fuel.

* * * * *

(c) ***Test Method.*** Compliance with the aromatic hydrocarbon content limitations specified in this section 2282 shall be determined by ASTM Test Method D 5186-96, which is incorporated herein by reference, through **[insert day before effective date]**. Starting **[insert effective date]**, compliance shall be determined by ASTM D5186-03(2009), which is incorporated herein by reference. The following correlation equation shall be used to convert the SFC results in mass percent to volume percent:

* * * * *

(g) ***Certified Diesel Fuel Formulations Resulting in Equivalent Emissions Reductions.***

* * * * *

(2) ***The candidate fuel.***

* * * * *

(B) The following characteristics of the candidate fuel shall be determined as the average of three tests conducted in accordance with the referenced test method (the ASTM methods are incorporated herein by reference):

* * * * *

2. Total aromatic hydrocarbon content, by ASTM D5186-96 (through **[insert day before the effective date]**) and by ASTM D5186-03(2009) (starting **[insert effective date]**);

3. Polycyclic aromatic hydrocarbon content, by ASTM D5186-96 (through **[insert day before the effective date]**) and by ASTM D5186-03(2009) (starting **[insert effective date]**);

* * * * *

(3) ***The reference fuel.***

* * * * *

Reference Fuel Specifications

Property	*ASTM Test Method*	*General Reference Fuel Specifications*	*Small Refiner Reference Fuel Specifications*

* * * * *

Aromatic Hydrocarbon Content, Vol. %	D5186-96 (through [**insert day before effective date**])	10% max.	20% max.
	D5186-03(2009) (starting [**insert effective date**])	10% max.	20% max.
Polycyclic Aromatic Hydrocarbon content, Wt. %	D5186-96 (through [**insert day before effective date**])	1.4% max.	4% max.
	D5186-03(2009) (starting [**insert effective date**])	1.4% max.	4% max.

* * * * *

(h) *Designated Equivalent Limits.*

(1) ***Designated equivalent limits.*** The designated equivalent limits under this section 2282 are set forth in the following table. Compliance with the limits for the properties shall be determined by the specified ASTM methods, which are incorporated herein by reference.

Property	*Equivalent Limit*	*Test Method*
Aromatic Hydrocarbon Content (% by wt.)	≤ 21.0	ASTM D5186-96 (through **[insert day before effective date]**) ASTM D5186-03(2009) (starting **[insert effective date]**)
PAH Content (% by wt.)	≤ 3.5	ASTM D5186-96 (through **[insert day before effective date]**) ASTM D5186-03(2009) (starting **[insert effective date]**)
* * * * *		

* * * * *

Note: Authority cited: Sections 39600, 39601, 43013, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975). Reference: Sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43016, 43018 and 43101, Health and Safety Code; and *Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District*, 14 Cal. 3d 411, 121 Cal. Rptr. 249 (1975).

CALIFORNIA AIR RESOURCES BOARD

NOTICE OF PUBLIC MEETING TO CONSIDER UPDATES TO THE PROPOSITION 1B: GOODS MOVEMENT EMISSION REDUCTION PROGRAM GUIDELINES

The Air Resources Board (ARB or Board) will conduct a public meeting at the time and place noted below to consider adopting updates to the Proposition 1B: Goods Movement Emission Reduction Program Guidelines (Program Guidelines).

DATE: January 25, 2013

TIME: 9:00 a.m.

PLACE: South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, California 91765

This item will be considered at a one-day meeting of the Board in Diamond Bar, which will commence at 9:00 a.m., January 25, 2013. Please consult the agenda for the meeting, which will be available at least ten (10) days before January 25, 2013, to determine the schedule on which this item will be considered.

BACKGROUND

The movement of freight (goods movement) throughout California results in emissions of diesel particulate matter (diesel PM), oxides of nitrogen (NOx), and other pollutants. Goods movement involves the use of a variety of mobile emission sources, such as heavy duty trucks, diesel locomotives, ocean-going cargo ships, harbor craft, and cargo handling equipment. ARB has identified diesel PM as a toxic air contaminant, and NOx contributes to regional ozone and PM levels that exceed State and federal air quality standards. The emissions from these mobile sources result in significant human health risks and adverse environmental effects, particularly when such sources release emissions near already heavily-impacted communities located in California's trade corridors where these sources operate.

Proposition 1B, approved by voters in 2006, authorizes $1 billion in bond funding to ARB to quickly reduce air pollution emissions and health risk from freight movement along California's four priority trade corridors.

The Proposition 1B: Goods Movement Emission Reduction Program (Program) is a partnership between ARB and local agencies (like air districts and ports). ARB develops the Program Guidelines and awards Program funding to local agencies; those agencies then use a competitive process to provide incentives to equipment owners to upgrade to cleaner technology. The local agencies are a critical part of the Program, and have assisted thousands of equipment owners in applying for and obtaining funding since the inception of the Program.

PROPOSED REVISIONS

The proposed updates to the Program Guidelines are part of a periodic process to revisit the Program requirements. ARB staff is not proposing any fundamental changes to the structure or goals of the Program at this time. The focus is on the specifications for eligible projects. The proposed updates include modifications to existing project options and funding levels based on upcoming regulatory compliance deadlines, and administrative changes to improve effectiveness.

Project Options and Funding Levels. The Program provides an incentive to equipment owners to upgrade to cleaner equipment and achieve early or extra emission reductions beyond those required by applicable regulations. However, many regulations are now in effect and their compliance deadlines are considered with each Program Guidelines update. The effect of the regulations on the Program is that the nature and cost-effectiveness of the eligible projects have changed. There are fewer projects that are "early" to the regulations, and for those that are, the proposed funding levels have been modified to ensure that the emission reductions are still cost-effective. Therefore, the Program is moving towards funding more projects with emission reductions that are "extra," including providing additional funding for zero/near-zero emission technologies to encourage equipment owners to purchase the cleanest equipment. Additionally, ARB staff is proposing to modify the eligibility and funding levels of several project categories based on feedback and new information received from the local agencies and stakeholders since the last Program Guidelines revision.

Administrative Changes. Based upon experience from prior grants and input from the local agencies implementing the Program, ARB staff developed and continues developing additional updates to the administration requirements within the Program Guidelines. These changes will streamline implementation while still maintaining the integrity of the Program.

For additional information on staff's proposal, please see the Program website at: http://www.arb.ca.gov/gmbond.

AVAILABILITY OF DOCUMENTS

A Staff Draft Concept Paper (October 30, 2012) and associated workshop slides describe staff's preliminary proposed updates to the Program Guidelines. These materials are currently available on the Program website.

ARB staff expects to release its formal recommendations for Board action in a Staff Report and in proposed updates to the text of the Program Guidelines. Paper copies of the Staff Report and proposed Guidelines may be obtained from the Public Information Office, Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814, (916) 322-2990, starting on January 14, 2013. The Staff Report and proposed Guidelines may also be obtained from the Program website listed above.

SUBMITTAL OF PUBLIC COMMENTS AND AGENCY CONTACTS

Interested members of the public may present comments orally or in writing at the meeting and may be submitted by postal mail or by electronic submittal before the meeting. To be considered by the Board, written comments not physically submitted at the meeting must be received **no later than 12:00 noon, January 23, 2013,** 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

You can sign up online in advance to speak at the Board meeting when you submit an electronic board item comment. For more information go to: http://www.arb.ca.gov/board/online-signup.htm.

Please note that under the California Public Records Act (Government Code section 6250 et seq.), your written and verbal comments, attachments, and associated contact information (e.g., your address, phone, email, etc.) become part of the public record and can be released to the public upon request.

ARB requests that written and email statements on this item be filed at least 10 days prior to the meeting so that ARB staff and Board members have additional time to consider each comment. Further inquiries regarding this matter should be directed to Mr. Ajay Mangat, Air Resources Engineer, at (916) 324-2718 or Ms. Barbara Van Gee, Manager, Goods Movement Strategies Section at (916) 324-9949.

SPECIAL ACCOMMODATION REQUEST

Special accommodation or language needs can be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language;
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerk of the Board at (916) 322-5594 or by facsimile at (916) 322-3928 as soon as possible, but no later than 10 business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Comodidad especial o necesidad de otro idioma puede ser proveído para alguna de las siguientes:

- Un intérprete que esté disponible en la audiencia;
- Documentos disponibles en un formato alterno u otro idioma;
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al (916) 322-5594 o envíe un fax a (916) 322-3928 lo más pronto posible, pero no menos de diez (10) días de trabajo antes del día programado para la audiencia del Consejo. TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

CALIFORNIA AIR RESOURCES BOARD

James N. Goldstene
Executive Officer

Date: January 7, 2013

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 at www.arb.ca.gov.

PROPOSITION 1B:
GOODS MOVEMENT EMISSION REDUCTION PROGRAM

Proposed Update to Guidelines for Implementation
STAFF REPORT

Board Consideration: January 25, 2013

California Environmental Protection Agency

Air Resources Board

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DOCUMENT AVAILABILITY

Electronic copies of this document and related materials can be found at: http://www.arb.ca.gov/gmbond. Alternatively, paper copies may be obtained from the Air Resources Board's Public Information Office, 1001 I Street, 1st Floor, Visitors and Environmental Services Center, Sacramento, California, 95814, (916) 322-2990.

If you need this document in an alternative format (i.e., Braille, large print) or another language, please contact Ms. Heather Jackson at (916) 322-8267 or hbjackso@arb.ca.gov. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

CONTACTS

Proposition 1B: Goods Movement Emission Reduction Program
Stationary Source Division

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

Website: http://www.arb.ca.gov/gmbond
Information Line: (916) 44-GOODS (444-6637)
Email: gmbond@arb.ca.gov

DISCLAIMER

This report has been reviewed by Air Resources Board staff and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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EXECUTIVE SUMMARY AND RECOMMENDATIONS

The Proposition 1B: Goods Movement Emission Reduction Program (Program) is underway, fulfilling its mandates to reduce diesel emissions and health risk in heavily impacted communities and help attain federal air quality standards. The Program funds are putting about 10,000 cleaner trucks on the road in California by the end of 2012, followed by ships at berth and locomotive projects that will mostly be operational in 2013. These projects will reduce over 4.8 million pounds of fine particulate matter (PM2.5) and 132 million pounds of nitrogen oxides (NOx) over their lifetime.

This Staff Report discusses the proposed update to the Program Guidelines for Implementation (Guidelines). These Guidelines define the procedures for the Air Resources Board (ARB or Board) and local agencies to administer the Program, as well as the specifications for eligible projects.

Since the last update to the Guidelines in 2010, ARB staff has worked extensively with local agencies to identify improvements to the Program to increase its effectiveness. The proposed updates are critical to: maximize benefits; expand the project choices; and streamline paperwork.

Key Changes Proposed

- Expand eligibility to include Class 6 trucks and prioritize zero-emission trucks
- Increase minimum truck mileage
- Modify maximum grant awards
- Increase locomotive funding for Tier 4s
- Provide progress payments for shore power
- Streamline equipment owner and local agency implementation

One of the core Program requirements is that the funded projects must achieve emission reductions "not otherwise required by law or regulation." However, the nature of eligible projects is changing. Since many ARB regulatory deadlines are now in effect; fewer projects provide early emission benefits and those projects that do are providing lower benefits than before. The ARB staff proposal continues to fund conventional projects but it also increases the options and funding amounts for hybrid, electric, and zero-emission equipment. These projects provide additional emission benefits by going beyond the current regulatory requirements, help advance needed transformative technology, and provide greenhouse gas reductions.

The largest Program category is heavy duty diesel trucks, accounting for 80 percent of all funding allocated. For this category, the Statewide Truck and Bus Rule will have required most trucks to be upgraded by the time additional Program funds are available. This will exclude most or all of the PM benefits from the Program; NOx benefits are still achievable. The staff proposal includes lowering the funding levels and minimum mileage to ensure the Program continues to obtain reasonable emission benefits for the funding invested. The staff proposal also includes significant streamlining of the truck projects, consistent with the integrity and intent of the Program, to simplify implementation.

ARB staff recommends that the Board adopt the proposed update to the Guidelines to expand the Program to cleaner options, to streamline the requirements for applicants and local agencies, and to ensure State funds are being used for cost-effective projects.

I. EXISTING PROGRAM

A. Program Basics

1. How do freight operations impact air quality and public health?

Diesel engines are used in trucks, locomotives, ships, harbor craft, and cargo handling equipment to move goods in California. These sources are major contributors to the State's biggest pollution challenges and account for more than two-thirds of the toxic diesel particulate matter (PM) statewide. They also produce about one-third of the nitrogen oxides (NOx) and sulfur oxides that form regional ozone and PM2.5, especially in the South Coast and San Joaquin Valley Air Basins.

California residents face serious health impacts from freight-related diesel pollution, especially in neighborhoods near seaports, railyards, roads with high truck traffic, and distribution centers. Freight-related emissions are a public health concern at both the community and regional levels because they contribute to serious health effects, such as cardiac and respiratory diseases, increased asthma and bronchitis episodes, increased risk of cancer, and premature death.

The California Air Resources Board (ARB or Board) has implemented a comprehensive program to characterize and reduce the impacts of air pollution from freight operations on nearby communities. Building on health risk assessments for major seaport and railyard facilities, ARB has adopted plans, regulations, incentive programs, and other strategies to cut emissions from freight sources. Major seaports and railyards are implementing additional measures to reduce the localized health risk near their facilities.

2. What is the Goods Movement Emission Reduction Program?

Proposition 1B, approved by voters in 2006, authorized $1 billion in bond funding to ARB to cut freight emissions in four priority trade corridors. These corridors are: the Los Angeles/Inland Empire, the Central Valley, the Bay Area, and the San Diego/Border area. Health and Safety Code section 39625 et seq. (shown as Appendix A) establishes the Proposition 1B: Goods Movement Emission Reduction Program (Program) and directs ARB to maximize the emission reduction benefits while achieving the earliest possible health risk reduction in communities heavily impacted by goods movement. Executive Order S-02-07 provides further direction to ensure accountability and transparency in administering bond-funded programs.

The Program provides financial incentives to owners of equipment used in goods movement to upgrade to cleaner technologies that reduce PM and NOx emissions, as well as greenhouse gases in some cases. The source categories eligible for bond funding include heavy-duty diesel trucks, freight locomotives, cargo ships at berth,

commercial harbor craft, cargo handling equipment, and infrastructure for electrification of truck stops, distribution centers, and other places trucks congregate.

3. How does the Program work?

ARB awards funding to local agencies (like air districts and ports). Those agencies then use a competitive process based on emission reductions and cost-effectiveness to provide incentives to equipment owners to upgrade to cleaner technology.

The Program supplements ARB's diesel regulations by funding early compliance or providing extra emission reductions beyond those required by applicable rules or enforceable agreements. The Proposition 1B ballot initiative specifically directs that ARB use the funds to achieve emission reductions "not otherwise required by law or regulation."

Reductions must be early or extra

Key existing ARB rules/requirements

- Statewide Truck and Bus Rule
- Drayage Truck Rule
- Truck Idling and Refrigeration Unit Rules
- Ship Fuel and At Berth Rules
- Harbor Craft Rule
- Cargo Handling Equipment Rule

4. What are the Program Guidelines?

As required by State law, the Board adopted the initial Program Guidelines in February 2008; and approved an update in March 2010. The Guidelines define the responsibilities of ARB, local agencies, and equipment owners, as well as the technical specifications and funding amounts for eligible projects. Modifications to the Guidelines made via Executive Order after March 2010 are incorporated in this update and are available on the Program website: http://www.arb.ca.gov/gmbond

5. How is the Program funded with bond monies?

The State sells bonds and distributes the proceeds to agencies for specific bond-funded projects. The type of bonds sold affects how the proceeds can be used. For example, only taxable bonds can be used for loan programs, and certain restrictions apply for administrative costs. Once proceeds are transferred into ARB's Program account, the State Treasurer's Office issues a tax compliance certificate for ARB signature and approves the signed certificate. ARB then has the authority to spend those monies.

ARB provides input on the Program's cash needs; however, ARB staff cannot predict the schedule for future bond sales or the availability of upfront proceeds for this purpose. Certainty comes only when staff is notified that ARB will receive a specified dollar amount following a successful bond sale.

Of the total $1 billion in bond proceeds, $980 million is to be used for this Program and $20 million set aside by the control agencies to cover bond issuance and oversight costs. To date, ARB has received almost $587 million for the Program. This leaves a balance of $393 million that ARB needs in new bond cash to implement future projects.

6. What are the match funding requirements?

Consistent with clear directives in the implementing legislation, the Program uses State bond funding to leverage other monies to achieve the greatest emission reductions per State dollar. By limiting the amount of Program funds available for each project, the number of individuals, businesses, and ports able to access those funds, as well as the resulting air quality benefits, are maximized.

While the Guidelines cap the maximum amount of bond funding for each project type, they do not require a fixed match ratio and they do not specify who must pay the remainder of the project cost. To provide flexibility, projects can be co-funded through a combination of private, federal, other State, and/or local sources.

B. Program Implementation

7. What is the status of projects awarded Year 1 funds

In February and May 2008, the Board awarded $247 million in funds to local agencies. All of these projects, except for one locomotive project, are now operational. The local agencies funded almost 5,000 truck replacement and retrofit projects. In addition, 3 ship berths have been upgraded with shore power and 18 locomotives have been repowered. Funds not used due to project fallout were reallocated and awarded to the Districts for their Year 3 grants. ARB staff estimates that truck upgrades, together with locomotive and shore power projects, will reduce over 2.7 million pounds of PM and 54 million pounds of NOx over their lifetime. Appendix B, *December 2012 Status Report to the Department of Finance (DOF)*, provides an update on each grant.

8. What is the status of projects awarded Year 2 and 3 funds

In June 2010, the Board awarded $200 million in funding based on cash received. Additional funds of $123 million became available along with funds redirected from ARB's administration costs and funds reallocated from Year 1 projects. The local agencies received a significant number of applications for truck projects; funding of these projects began in 2011 and will continue to be implemented through 2014. Most of the 5,700 truck retrofit and replacement projects were operational by the end of 2012, with a portion of the projects in the first quarter of 2013, and small fleet projects completed by the end of 2013. In addition, one harbor craft project and 34 shore power projects are expected to be operational in 2013; in 2014, six locomotive projects are expected to become operational. ARB staff estimates that these upgrades will reduce 2.1 million pounds of PM and 78 million pounds of NOx over their lifetime.

II. PROPOSED CHANGES TO THE PROGRAM

A. Development and Schedule

9. What outreach has ARB staff done to develop this proposed update?

The implementation of fiscal year (FY) 2008-09 (year 2), and FY 2011-12 (year 3) funds, which began in 2010, has resulted in close communication between ARB staff and the local agencies. Based on this working experience, information obtained during implementation, and feedback from local agencies and equipment owners, ARB staff released a Draft Concept Paper in October 2012. ARB held three public workshops in Sacramento, the Central Valley, and Southern California in November 2012 to solicit input from local agencies, the trucking industry, railroads, shippers, equipment manufacturers, and environmental representatives. ARB staff has also received written comments from stakeholders. The proposed update to the Guidelines incorporates many of the suggestions received as a result of our outreach efforts.

An ongoing and comprehensive ARB outreach effort has been conducted to inform the public on regulations along with the suite of incentive programs. Incentive information is presented at regulatory training events and is readily available on the ARB website. In addition, compliance checks are required for incentive funding to ensure accordance with ARB regulations.

10. What is the tentative schedule for the next funding awards?

To date, the Program has received approximately $587 million in project and administrative funds. This leaves $393 million to implement in FY2012-13 (year 4) and beyond. The tentative schedule for ARB and local agency actions to implement the Program for FY2012-13 funds is shown below. At the request of local agencies, solicitations may be held prior to executed grant agreements, as long as ARB has received bond proceeds or monies from other funding mechanisms. This schedule is subject to change and may be accelerated if possible:

February 2013	Notice of Funding Availability. Once the Board acts on the updated Program Guidelines, ARB staff will issue a Notice of Funding Availability and solicit local agency project proposals.
April 2013	Local agency project applications. Local agencies will submit proposals (by funding category) to ARB to implement incentives for eligible projects.
May 2013	Public review and ARB staff evaluation of proposals. ARB will review and post eligible applications on the Program website. ARB staff will evaluate eligible applications based on criteria in the Guidelines, recommend projects for funding, and hold public workshops.

June 2013 — Local agency project awards. The Board will hold a public hearing to consider the recommended funding awards for specific primary and backup local agency projects (and any State agency loan or loan guarantee program). Any awards must be consistent with State fiscal policy and contingent on the availability of bond funding.

The following steps will occur following receipt of new bond monies:

June 2013 and later — Agreements with local and State agencies. As bond funds become available, ARB staff will execute grant agreements with the local agencies (and interagency agreements with State agencies for loan or loan guarantee programs), based on the list of primary and backup projects approved by the Board. The execution of the grant agreements starts the statutory time clocks for local agencies to obligate funds through an executed equipment project contract.

Equipment owner applications and awards. Local agencies will solicit and evaluate applications for equipment projects, work with ARB to develop a competitively ranked list according to the Guidelines, and select eligible projects. Local agencies will then execute contracts with equipment owners to fund projects. Solicitations may be held prior to executed grant agreements if a process is approved by ARB.

Installation of cleaner technology. As project contracts are executed, equipment owners will begin purchasing and installing cleaner equipment.

11. How did the 2012 Drayage Replacement Program affect the trade corridor funding targets?

In December 2011, the Board directed ARB staff to establish and implement a drayage priority reserve directed to achieve early emission reductions through the replacement of older drayage trucks. In response, ARB staff worked with the Bay Area Air Quality Management District and the South Coast Air Quality Management District to develop the 2012 Drayage Replacement Program. Providing drayage funds to these two local agencies temporarily increased the share for the Los Angeles/Inland Empire and Bay Area corridors above the Board approved funding targets.

Consistent with prior Board direction, ARB staff will recommend funding awards in the next round that restore each corridor to its target levels.

Table 1 Board Approved Trade Corridor Funding Targets

Funding* to Date	Percentage	Percentage Target	Trade Corridor
$308 million	54.6%	55.0%	Los Angeles/Inland Empire
$139 million	24.6%	25.0%	Central Valley
$ 88 million	15.7%	14.0%	Bay Area
$ 29 million	5.1%	6.0%	San Diego/Border

* Includes local agency administration costs, but does not include ARB administrative costs or truck loan assistance program.

12. What are the priorities for Year 4 and later funds?

ARB staff is proposing that the Board adopt the following priorities for Year 4 and later funds:

- Truck upgrade projects to reduce the health risk and also provide reductions to help meet federal air quality standards for regional air pollutants. This is consistent with statutory direction to give priority to projects that achieve the earliest possible reduction of health risk in heavily impacted communities.

- Locomotive projects to cut the elevated, excess cancer risks in neighborhoods near rail yards, as identified in ARB's health risk assessments. The California State Implementation Plan relies on incentives and other mechanisms to accelerate the introduction of cleaner locomotives and/or engines to attain federal PM2.5 and ozone standards in the South Coast and San Joaquin Valley air basins.

- Enhanced funding for zero-emission equipment to provide an added incentive to applicants and to promote transition to the cleanest zero-emission technology for future projects. A broader deployment of these zero-emission technologies will be needed in the South Coast and San Joaquin Valley air basins to attain health-based air quality standards as well as attain future long-term greenhouse gas reduction goals.

B. Equipment Project Specifications

The specifications for eligible equipment projects are an integral part of the Program Guidelines. For each equipment project option, these specifications define the eligibility criteria, technology and emission standards, project funding caps, project life, and operational and reporting requirements. The Board directed ARB staff to evaluate advances in technology, changes in equipment costs, regulatory actions, demand for Program funds in the prior funding cycle, and other new information that influences the design of project specifications after each appropriation of new funds.

The proposed update to the Guidelines will revise existing project options and add new options to take advantage of cleaner technology that is currently available or expected to be available.

Many regulations are now in effect and their compliance deadlines are taken into consideration with each update of the Guidelines. The effect of the regulations on the Program is that the nature of the eligible projects has changed. There are fewer projects that are "early" to the regulations; therefore in this update, the Program is moving towards funding eligible projects with emission reductions that are "extra." As a result, ARB staff is proposing to provide additional funding for hybrid, electric, and zero-emission technology projects that go beyond existing requirements to provide extra emission reductions and encourage equipment owners to purchase the cleanest available equipment.

Local agencies choose which source and funding categories they wish to administer. Under the staff proposal, these agencies would continue to solicit, evaluate, rank, and fund applications for equipment project options in their chosen categories, with selection of projects determined by the competitive process.

13. What is the basis for the truck project options?

Trucks are subject to ARB's Drayage Truck Rule or the Statewide Truck and Bus Rule, which define the schedule to upgrade existing trucks to cleaner models. These rules focus on near-term retrofits of PM filters on existing trucks and longer-term eventual upgrade of those trucks to Model Year (MY) 2007 and MY2010 engines. As the Program continues to move forward, truck projects approach these regulatory compliance deadlines which limit funding opportunities for conventional projects.

ARB previously dedicated over $135 million of Program funds to retrofit or replace over 3,500 drayage trucks. However, due to the compliance deadlines of the Drayage Truck Rule that are in effect, there are limited opportunities to obtain "extra" emissions reductions through the Program in this source category.

The Statewide Truck and Bus Rule was updated by the Board in December 2010 and is being implemented. To determine which projects will be eligible for Program funds, ARB staff reviewed the compliance deadlines under the Rule to ensure that emission reductions would be "early or extra." ARB staff identified funding opportunities for both large and small fleets, if the fleets maintain compliance with the Rule requirements. The amount of "early or extra" PM reductions that can be achieved in 2014 (when projects are expected to be operational) is significantly less than for current projects; so future projects will yield primarily NOx reductions. Consequently, the proposed funding levels have been reduced to be in line with the available reductions and still meet the legislative requirement to ensure that the Program continues to obtain significant emission reductions for the state dollars invested. In addition, ARB staff is proposing to remove the PM retrofit project option and also would no longer allow projects with

replacement trucks containing engines less stringent than MY2010 emissions. The Program Guidelines specifically define the allowable "MY2010 emissions" for truck engines, based on the ARB Executive Order certifying the engine.

One area where PM reductions can still be achieved is with the replacement of Class 6 trucks. ARB staff recommends allowing Class 6 trucks that are involved in goods movement to compete for funding because these trucks are not required to install a PM retrofit and have extended compliance dates within the Statewide Truck and Bus Rule.

Additionally, ARB staff recommends the ability to co-fund zero-emission truck projects with the AB 118: Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (AB 118 or HVIP) to encourage equipment owners to purchase the cleanest equipment.

A local agency evaluates applications from truck owners for all of the project options and scores each application based on the established criteria of emission reductions and cost-effectiveness to determine which trucks receive funding. Each truck competes independently, so there is no advantage or disadvantage based on fleet size.

Table 2 Proposed Equipment Project Options for Trucks

Eligible Equipment and Upgrade		Maximum Program Funding	Project Life
A	Replace Class 8 truck with MY1994-2006 engine with a truck meeting MY2010 emissions[1]	MY2013 engine or newer: $50,000 MY 2010-2012 engine: $40,000	5 yrs or 500,000 mi (whichever comes first)
B	Replace Class 7 truck with MY1994-2006 engine with a truck meeting MY2010 emissions[1]	MY2010 engine or newer: $35,000	
C	Replace Class 6 truck with MY1996-2006 engine with a truck meeting MY2010 emissions[1]	MY2013 engine or newer: $25,000	
D	Replace Class 6-8 truck with MY1994-2006 engine with zero-emission vehicle	Including AB 118 funds[2]: $65,000 to $105,000	
E	Repower truck with MY1994-2006 engine with new engine that meets MY2010 emissions[1]	Class 7 & 8: $20,000 Class 6: $10,000	
F	Three-way truck transaction: (1) Replace truck with MY1998-2006 engine with newer truck meeting MY2010 emissions[1] (2) Retrofit MY1998-2006 truck with PM filter (3) Scrap old truck with MY1993 or older engine	Same dollar amount as replacement above N/A	
G	Electrification infrastructure for a truck stop or distribution center to reduce diesel engine use	Lower of 50% of eligible costs or a funding level that provides a cost-effectiveness of 0.10 lbs/State $	10 yrs

[1] MY2010 emissions means an engine certified by ARB Executive Order on the heavy duty test cycle to CERT and FEL emissions of 0.20 grams per brake-horsepower hour (g/bhp-hr) NOx and 0.01 g/bhp-hr PM or less.

[2] Subject to availability of AB 118 funds and the requirements of the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program.

14. How does the implementation of truck projects coincide with the Statewide Truck and Bus Rule and what effect does this have on emission reductions?

ARB staff expects truck replacement projects to become operational in 2014. This timeframe coincides directly with the compliance deadlines of the Statewide Truck and Bus Rule. The Rule's Engine Model Year Schedule requires all trucks with an engine model year of 1996-2006 to be equipped with a PM filter. The Rule's Phase-In Option requires large fleets to equip 90 percent of their vehicles with a PM filter by 2014, and 100 percent of their vehicles by 2016. These requirements significantly limit the ability to achieve substantial PM benefits for the majority of truck replacement projects.

ARB staff has assessed the dynamics of the Truck and Bus Rule and recommends the following changes to Program eligibility to ensure that the Program continues to obtain significant emission reductions for the State dollars invested.

- Removing retrofit project eligibility. These projects are no longer eligible for funding because the compliance deadlines in the Truck and Bus Rule prevent projects from achieving cost-effective early or extra emission reductions.

- Increasing the minimum mileage required to participate in the Program from 5,000 miles per year to 20,000 miles per year for Class 7 and 8 trucks and establishing a 10,000 mile per year minimum mileage for Class 6 trucks.

- Requiring the purchase of newer trucks to be limited to those with an engine that meets MY2010 emissions which the Program defines as: 0.20 grams per brake horsepower-hour (g/bhp-hr) or less NOx (FEL and CERT values) and 0.01 g/bhp-hr or less PM (CERT value). Replacement of old trucks with trucks meeting MY2010 emissions reduces NOx emissions by over 80 percent compared to the MY2007 emissions. This would maximize emission reductions and is consistent with the Program's goal to promote the cleanest certified available technology.

- Establishing higher incentives for new (2013 engine model year or newer) Class 8 trucks. These trucks have increased on board diagnostic requirements that will ensure lower emissions throughout the project life.

- Removing 1993 and older trucks from replacement project eligibility. These projects are no longer eligible for funding because the compliance deadlines in the Truck and Bus Rule prevent projects from achieving cost-effective early or extra emission reductions.

15. How is the Program adjusting eligibility requirements to provide additional opportunities for incentive funding?

ARB staff is proposing a number of changes to expand eligibility for truck applicants.

- Allow Class 6 trucks that are involved in goods movement to compete for funding. These trucks have later compliance deadlines in the Truck and Bus Rule which will allow Program funds to be used for projects that still provide substantial PM benefits.

- Expand eligibility requirements for Class 7 and 8 trucks to include 2004-2006 engine model years. These engines did not previously provide cost-effective benefits compared to the replacement of 2003 and older trucks, since the emission reductions were based on a replacement truck with MY2007 emissions. With the requirement to upgrade to a truck with MY2010 emissions, which provides a NOx reduction of over 80 percent, these replacement projects now provide significant emission reductions for the State dollars invested.

- Allow co-funding for zero-emission trucks with HVIP which will provide an added incentive to applicants and promote transition to the cleanest technology for future projects. Applications for zero-emission trucks will be prioritized and their funding coordinated with HVIP to provide streamlined funding.

16. What is the basis for the locomotive project options?

The proposed changes to the project options include providing a higher amount of Program funding for early introduction of locomotives meeting the U.S. Environmental Protection Agency's (U.S. EPA) most stringent Tier 4 emission standards that require highly effective PM and NOx control. In addition, updates include modifying eligibility requirements involving operation in California and other mechanisms to improve flexibility.

Table 3 Proposed Equipment Project Options for Locomotives and Railyards

	Eligible Equipment[1]	Upgrade[1]	Maximum Program Funding	Project Life
A	Switcher *(1,006 hp-2,300 hp)* or medium horsepower line-haul locomotive *(2,301 hp-4,000 hp)* Uncontrolled through Tier 1+ diesel freight locomotive	Replace, repower, or rebuild with new engine, or install alternative technology to meet Tier 4 or lower emission standards for both NOx and PM	(a) Lower of 60% of eligible cost or $1.8M if operational by 12/31/2015 (b) Lower of 50% of eligible costs or $1.5M if operational after 12/31/2015	15 yrs
B	Line-haul locomotive *(4,001 hp or higher).* Uncontrolled through Tier 2 diesel freight locomotive	Replace, repower, or rebuild with a new engine, or install alternative technology to meet Tier 4 or lower emission standards for both NOx and PM	(a) Lower of 70% of eligible cost or $2.1M if operational by 12/31/2015 (b) Lower of 60% of eligible costs or $1.8M if operational after 12/31/2015	15 yrs
C	Existing freight railyard	Install infrastructure for a locomotive emissions capture and control system (a.k.a. hood or bonnet) that achieves a capture and control efficiency rate of at least 85% for NOx and 85% for PM	(a) Lower of 50% of eligible cost or a level commensurate with a cost-effectiveness of 0.15 lbs/State $ or higher	10 yrs

[1] References to engine "Tiers" mean the applicable emission standards established by the U.S. Environmental Protection Agency.

17. Why is ARB proposing to upgrade to Tier 4 locomotives?

The Tier 4 emission standards significantly reduce PM and NOx emissions and will apply to new locomotives manufactured beginning in 2015. This coincides with the timeframe when the projects will be operational, as it takes approximately 2 years to manufacture locomotives. By offering to pay a greater share (percentage and dollar amount) of the cost for these engines, ARB staff hopes to create customer demand for the technology and spur manufacturers to make them available sooner.

Additionally, ARB staff acknowledges that the development of these Tier 4 engines is required by federal regulations, but the engines are not yet commercially available. Therefore, in response to local agency concerns regarding the delivery period for Tier 4 locomotives, ARB staff is proposing to ask the Board for the discretion to approve requests for extensions in deadlines (within statutory authority) if it is determined that there are manufacturer delays in the production Tier 4 engines.

Although the Program requires a 15 year contract life for locomotive projects, many new locomotives remain in service for 30 years or longer. ARB staff recognizes that this extended timeframe will provide additional emissions benefits beyond the calculated project life. ARB staff is proposing to support the cleanest engine technology to maximize these benefits.

18. Are there any updates to either the eligibility or operating requirements of locomotive projects?

ARB staff is proposing a change to allow applicants upgrading medium horsepower and line-haul locomotives to select a 90 percent California operation option for the new equipment with no reduction to the amount of funding.

ARB staff is also proposing operational flexibility that allows replaced Tier 2 locomotives to stay within the State as long as a dirtier locomotive is scrapped or banned from California.

19. What is the basis for the ships at berth project options?

ARB's Ocean-Going Vessels At-Berth Rule (Shore Power Rule) begins to phase in emission control requirements from 2010-2014, depending on the technology chosen to comply. Given the impending deadlines and the substantial lead time needed to design and build/install the technology, ARB staff can no longer expect that Program funds will provide early emission reductions.

Our focus for this source category must now be on achieving "extra" emission reductions, beyond those required under the Shore Power Rule, by providing funding for berths that service ships not covered by the regulation (e.g., vehicle carriers, bulk ships, and tankers). Because all benefits are "extra" for ships not covered by the Shore Power Rule, ARB staff is proposing to reduce the required minimum number of operating hours for non-grid-based shore power projects and the emissions capture and control system.

Additionally, ARB staff is proposing to require a minimum cost-effectiveness equal to or greater than 0.10 pounds of weighted emissions reduced per State dollar invested for grid-based shore power projects.

Although the Program typically requires projects to be completed and post-inspected prior to payment, the long term nature and high cost of ships at berth projects makes this process financially challenging for ports without significant capital. In response to the Governor's direction in his veto message on SB 234 and consistent with the ports' request, ARB staff is proposing progress payments for grid-based shore power projects that are currently under contract with the local agencies. This flexibility would also be extended to future shore power projects.

As proposed, the local agencies would reimburse the equipment owner (seaport or terminal operator) for up to 80 percent of eligible project costs, provided the equipment owner has expended the non-State match funding for each berth, and is in compliance with the equipment project contract. The Governor also directed ARB to provide additional flexibility for small seaports (less than 10 berths) if they experience difficulties meeting these conditions. ARB staff has worked with applicable stakeholders to provide additional flexibility while maintaining our fiduciary responsibility.

Table 4 Proposed Equipment Project Options for Ships at Berth

Eligible Equipment		Upgrade	Maximum Program Funding	Project Life	Other Conditions (partial description)
A	Existing cargo ship berth or terminal that does not receive visits by ships subject to the Shore Power Rule	Install grid-based power (landside infrastructure to berth)	Lower of 50% of eligible cost or $2.5M	10 yrs	Ship visits must result in a cost-effectiveness of 0.10 lbs/State $ or higher
B	Existing cargo ship berth or terminal that does not receive visits by ships subject to the Shore Power Rule	Install grid-based power (landside infrastructure to berth)	Lower of 60% of eligible cost or $3.5M	10 yrs	Ship visits must result in a cost-effectiveness of 0.20 lbs/State $ or higher
C	Existing cargo ship berth or terminal that does not receive visits by ships subject to the Shore Power Rule	Install non-grid-based power (zero-emission system or natural gas engine with selective catalytic reduction)	$200k/MW	5 yrs	Ports of Los Angeles and Long Beach: 1,500 hrs/yr (2014 onwards) Other seaports: 1,000 hrs/yr (2014 onwards)
D	Existing cargo ship berth or terminal that does not receive visits by ships subject to the Shore Power Rule	Install an emissions capture and control system (a.k.a. hood or bonnet) that achieves a minimum control effectiveness of 85% for NOx and 85% for PM	Lower of 50% of eligible cost or funding level that provides a cost-effectiveness of at least 0.15 lbs/State $	10 yrs	Ports of Los Angeles and Long Beach: 1,500 hrs/yr (2014 onwards) Other seaports: 1,000 hrs/yr (2014 onwards)

20. What is the basis for the commercial harbor craft project options?

ARB's Commercial Harbor Craft Rule requires specific vessel types to upgrade to cleaner technology over time. ARB staff is proposing to update the existing project options for the repower, replacement, and/or upgrade to hybrid power systems of regulated commercial harbor craft and harbor craft not subject to the Rule.

To date, harbor craft owners have shown little interest in using Program incentives. Owners shared concerns about the boundary of operations for vessels and the low level of incentive funding. The staff proposal would extend operations beyond the current limit of 24 nautical miles (nm) to the California Coastal Waters boundaries (consistent

with the Carl Moyer Program), and also increase the funding level for all project options. This proposal provides an opportunity for more projects without a detriment to cost-effective emission reductions.

ARB staff is also recommending limiting replacement and repower to Tier 3 or better diesel engines, expanding repower or replacement with a hybrid power system to all eligible vessels (tug boats, tow boats, crew and supply vessels, work or pilot boats, and commercial fishing vessels), and setting a minimum cost-effectiveness for all projects. In addition, since upgrading auxiliary engines also achieves emission reductions and there are often advantages of upgrading both propulsion and auxiliary engines at the same time, ARB staff is recommending allowing eligibility of auxiliary engines.

Although the Program requires an 8 year contract life for commercial harbor craft projects, many new vessels will remain in service much longer. ARB staff recognizes that this extended timeframe will provide additional emissions benefits beyond the calculated project life. ARB staff is proposing to support the cleanest engine technology to maximize these benefits.

Table 5 Proposed Equipment Project Options for Commercial Harbor Craft

	Eligible Equipment[2]	Upgrade[2]	Maximum Program Funding	Project Life
A	Regulated in-use: Diesel-powered tugboats, towboats with existing Tier 0 or Tier 1 engine(s)	Repower engine(s) or replace vessel with new Tier 3 or cleaner engine[1]	Lower of 50% of eligible cost or up to $175/hp of old engine; funding level that provides a cost-effectiveness of 0.10 lbs/State $ or higher	8 yrs
B	Not regulated in-use: Diesel-powered work or pilot vessels or commercial fishing vessels with existing Tier 0 or Tier 1 engine(s)	Repower engine(s) or replace vessel with new Tier 3 or cleaner engine	Lower of 80% of eligible cost or up to $280/hp of old engine; funding level that provides a cost-effectiveness of 0.10 lbs/State $ or higher	8 yrs
C	Diesel-powered tugboats, towboats, pilot or work boats, or commercial fishing vessels with existing Tier 2 or Tier 3 engine(s)	Retrofit hybrid power system on existing vessel; or replace existing vessel with a new vessel powered by a hybrid power system that achieves 30% PM and NOx emission reductions as compared to the original vessel, operating hours and duty cycle[3]	Lower of 80% of eligible cost or up to $100/hp of old engine; funding level that provides a cost-effectiveness of 0.10 lbs/State $ or higher	8 yrs

[1] Upgraded vessel must be operational at least 2 years before the applicable compliance date.

[2] References to engine "Tiers" mean the applicable emission standards for marine engines established by the U.S. Environmental Protection Agency (U.S. EPA) incorporated in ARB's Commercial Harbor Craft Regulation.

[3] An equipment owner may receive a grant to repower/replace a vessel (under option A or B) and add a hybrid power system in the same upgraded vessel. If combining option C with option A or B the maximum funding available for the project (combined options) is the lower of the total cost or up to $380/hp of the old engine.

21. What is the basis for the cargo handling equipment project options?

Since the Board adopted the Cargo Handling Equipment Rule in December 2005, many of the compliance deadlines have passed. Therefore, the upgraded equipment must move towards zero-emission technology to provide "extra" emission reductions. ARB staff is proposing to increase the funding amount for rubber-tired gantry cranes and expand existing engine model year eligibility to 2006 for both project options.

ARB staff has determined that it is not viable to require the destruction of the existing diesel engine for rubber-tired gantry cranes because these engines are needed to move cranes from line to line, or in emergency situations where electrical power is not available. In this case, to ensure emission reductions are achieved, ARB staff is proposing to limit the usage of the older diesel engine to a maximum of 30 hours annually.

Table 6 Proposed Equipment Project Options for Cargo Handling Equipment

	Eligible Equipment	Upgrade	Maximum Program Funding	Project Life
A	Existing rubber-tired gantry crane (with 2006 or older MY engine)[1]	Repower or replace with a zero-emission power system.	Lower of 50% of eligible cost or $500k	15 yrs
B	Existing diesel-powered yard truck (with 2006 or older MY engine)[2]	Repower or replace with a new zero-emission yard truck	Lower of 50% of eligible cost or $50k	5 yrs

[1] Program funded equipment cannot be used to comply with the regulatory requirement for replacing non-compliant equipment with electric or hybrid power systems associated with obtaining third and/or fourth years of "No VDECS Available" compliance extension.

[2] Program funded equipment is not eligible to be counted towards Rule compliance for a 2-year period.

22. How does the Program encourage reductions in greenhouse gas emissions?

With the proposed changes, the Program would encourage greenhouse gas reductions in the following ways:

- The proposed updates would encourage greater State funding for projects with significant greenhouse gas reductions. Project criteria are enhanced for hybrid and/or electric equipment in the truck, ships at berth, harbor craft, and cargo handling equipment categories.

- The majority of the projects eligible for funding involve replacing old diesel engines with more fuel efficient models or alternative power systems that typically cut emissions of all pollutants. An equipment owner can currently apply for and receive Program funds for cleaner diesel, natural gas, electric, hybrid, or other technology that meets PM and NOx performance standards.

- ARB has supported the ability of local agencies to supplement the Program funds with federal and local monies to make alternative fuel choices that may have lower greenhouse gas emissions more attractive.

C. Program Administration

23. How would the proposal improve local agency administration of the Program?

Based upon experience with previous grants, ARB staff worked with local agencies to develop improvements to the administrative requirements to reduce the workload and maximize the efficiency of the Program. These improvements were developed based on feedback received and will simplify the application process for the equipment owner and reduce local agency workload, while maintaining an appropriate balance with the fiduciary obligations of the Program. The proposed changes will lead to less paperwork and shorter local agency review times, benefitting applicants as well as local agencies.

Streamline registration documentation requirements. For truck projects, the proposed update would utilize information provided by the Department of Motor Vehicles to verify California registration minimizing the amount of paperwork needed.

Streamline prior California operation documentation requirements. For truck projects, the proposed update would allow for simplified documentation (e.g., repair logs) to verify prior California operation.

Streamline equipment owner annual reports. The proposed updates would reduce the frequency for local agencies to submit equipment owner data to ARB. Instead of submitting equipment owner data on a biannual basis, local agencies would submit these reports annually.

Streamline general administrative requirements. The proposed updates would reduce general administrative requirements to run a more efficient Program, based on recommendations provided by local agencies.

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APPENDIX A
IMPLEMENTING STATUTE

California Health and Safety Code Sections 39625-39627.5

39625. The Legislature finds and declares as follows:

(a) In November 2006, the voters approved the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, also known as Proposition 1B, that, among other things, provided one billion dollars ($1,000,000,000) to reduce emissions associated with the movement of freight along California's trade corridors.

(b) Proposition 1B requires these funds to be made available, upon appropriation by the Legislature and subject to the conditions and criteria provided by the Legislature, to the State Air Resources Board in order to reduce the emissions associated with goods movement.

(c) Proposition 1B further required these funds to be made available for emission reductions not otherwise required by law or regulation. These funds are intended to supplement existing funds used to finance strategies that reduce emissions and public health risk associated with the movement of freight commencing at the state' s seaports and land ports of entry and transported through California' s trade corridors.

(d) Tremendous growth in goods movement activity has created a public health crisis in communities located adjacent to ports and along trade corridors. It is the intent of the Legislature that these funds be expended in a manner that reduces the health risk associated with the movement of freight along California's trade corridors.

(e) It is the intent of the Legislature that the state board maximize the emission reduction benefits, achieve the earliest possible health risk reduction in heavily impacted communities, and provide incentives for the control of emission sources that contribute to increased health risk in the future.

(f) It is the intent of the Legislature that the state board develop partnerships between federal, state, and private entities involved in goods movement to reduce emissions.

(g) The purpose of this chapter is to establish standards and procedures for the expenditure of these funds.

39625.01. This chapter shall be known, and may be cited, as the Goods Movement Emission Reduction Program.

39625.02. (a) As used in this chapter and in Chapter 12.49 (commencing with Section 8879.20) of Division 1 of Title 2 of the Government Code, the following terms have the following meanings:

(1) "Administrative agency" means the state agency responsible for programming bond funds made available by Chapter 12.49 (commencing with Section 8879.20) of Division 1 of Title 2 of the Government Code, as specified in subdivision (c).

(2) Unless otherwise specified in this chapter, "project" includes equipment purchase, right-of-way acquisition, and project delivery costs.

(3) "Recipient agency" means the recipient of bond funds made available by Chapter 12.49 (commencing with Section 8879.20) of Division 1 of Title 2 of the Government Code that is responsible for implementation of an approved project.

(4) "Fund" shall have the meaning as defined in subdivision (c) of Section 8879.22 of the Government Code.

(b) Administrative costs, including audit and program oversight costs for the agency administering the program funded pursuant to this chapter, recoverable by bond funds shall not exceed 5 percent of the program's costs.

(c) The State Air Resources Board is the administrative agency for the goods movement emission reduction program pursuant to paragraph (2) of subdivision (c) of Section 8879.23 of the Government Code.

(d) The administrative agency shall not approve project fund allocations for a project until the recipient agency provides a project funding plan that demonstrates that the funds are expected to be reasonably available and sufficient to complete the project. The administrative agency may approve funding for usable project segments only if the benefits associated with each individual segment are sufficient to meet the objectives of the program from which the individual segment is funded.

(e) Guidelines adopted by the administrative agency pursuant to this chapter and Chapter 12.49 (commencing with Section 8879.20) of Division 1 of Title 2 of the Government Code are intended to provide internal guidance for the agency and shall be exempt from the Administrative Procedure Act (Chapter 3.5 (commencing with Section 11340) of Part 1 of Division 3 of Title 2 of the Government Code), and shall do all of the following:

(1) Provide for audit of project expenditures and outcomes.

(2) Require that the useful life of the project be identified as part of the project nomination process.

(3) Require that project nominations have project delivery milestones, including, but not limited to, start and completion dates for environmental clearance, land acquisition, design, construction bid award, construction completion, and project closeout, as applicable.

(f) (1) As a condition for allocation of funds to a specific project under Chapter 12.49 (commencing with Section 8879.20) of Division 1 of Title 2 of the Government Code, the administrative agency shall require the recipient agency to report, on a semiannual basis, on the activities and progress made toward implementation of the project. The administrative agency shall forward the report to the Department of Finance by means approved by the Department of Finance. The purpose of the report is to ensure that the project is being executed in a timely fashion, and is within the scope and budget identified when the decision was made to fund the project. If it is anticipated that project costs will exceed the approved project budget, the recipient agency shall provide a plan to the administrative agency for achieving the benefits of the project by either downscoping the project to remain within budget or by identifying an alternative funding source to meet the cost increase. The administrative agency may either approve the corrective plan or direct the recipient agency to modify its plan.

(2) Within six months of the project becoming operable, the recipient agency shall provide a report to the administrative agency on the final costs of the project as compared to the approved project budget, the project duration as compared to the original project schedule as of the date of allocation, and performance outcomes derived from the project compared to those described in the original application for

funding. The administrative agency shall forward the report to the Department of Finance by means approved by the Department of Finance.

39625.1. As used in this chapter, the following terms have the following meanings:
(a) "Applicant" means any local public entity involved in the movement of freight through trade corridors of the state or involved in air quality improvements associated with goods movement. For the purposes of administering a loan or loan guarantee program only, an applicant may include any state agency.
(b) "Emission" or "emissions" means emissions including, but not limited to, diesel particulate matter, oxides of nitrogen, oxides of sulfur, and reactive organic gases.
(c) "Emission sources" means one of the following categories of sources of air pollution associated with the movement of freight through California's trade corridors: heavy-duty trucks, locomotives, commercial harbor craft, ocean-going vessels related to freight, and cargo-handling equipment.
(d) "Goods movement facility" means airports, seaports, land ports of entry, freight distribution warehouses and logistic centers, freight rail systems, and highways that have a high volume of truck traffic related to the movement of goods, as determined by the state board.
(e) "Trade corridors" means any of the following areas: the Los Angeles/Inland Empire region, the Central Valley region, the Bay Area region, and the San Diego/border region.

39625.3. Funding pursuant to this chapter may include grants, loans, and loan guarantees.

39625.5. (a) (1) Upon appropriation by the Legislature from the funds made available by paragraph (2) of subdivision (c) of Section 8879.23 of the Government Code, the state board shall allocate funds on a competitive basis for projects that are shown to achieve the greatest emission reductions from each emission source identified in subdivision (c) of Section 39625.1, not otherwise required by law or regulation, from activities related to the movement of freight along California's trade corridors, commencing at the state's airports, seaports, and land ports of entry.
(2) Projects eligible for funding pursuant to paragraph (1) shall include, but are not limited to, the following:
(A) The replacement, repower, or retrofit of heavy-duty diesel trucks.
(B) The replacement, repower, or retrofit of diesel locomotive engines, with priority given to switching locomotive engines, provided that before any project is authorized for a locomotive engine operated and controlled by a railroad company that has entered into a memorandum of understanding or any other agreement with a state or federal agency, a local air quality management district, or a local air pollution control district, including, but not limited to, the ARB/Railroad Statewide Agreement Particulate Emissions Reductions Program at California Rail Yards, dated June 2005, the state board shall determine that the emission reductions that would be achieved by the locomotive engine are not necessary to satisfy any mandated emission reduction requirement under any such agreement.
(C) The replacement, repower, or retrofit of harbor craft that operates at the state's seaports.

(D) The provision of on-shore electrical power for ocean freight carriers calling at the state's seaports to reduce the use of auxiliary and main engine ship power.

(E) Mobile or portable shoreside distributed power generation projects that eliminate the need to use the electricity grid.

(F) The replacement, repower, or retrofit of cargo handling equipment that operates at the state's seaports and rail yards.

(G) Electrification infrastructure to reduce engine idling and use of internal combustion auxiliary power systems at truck stops, intermodal facilities, distribution centers, and other places where trucks congregate.

(b) (1) The state board shall allocate funds in a manner that gives priority to emission reduction projects that achieve the earliest possible reduction of health risk in communities with the highest health risks from goods movement facilities.

(2) In evaluating which projects to fund, the state board shall at a minimum consider all of the following criteria:

(A) The magnitude of the emission reduction.

(B) The public health benefits of the emission reduction.

(C) The cost-effectiveness and sustainability of the emissions reductions.

(D) The severity and magnitude of the emission source's contributions to emissions.

(E) Regulatory and State Implementation Plan requirements, and the degree of surplus emissions to be reduced.

(F) The reduction in greenhouse gases, consistent with and supportive of emission reduction goals, consistent with existing law.

(G) The extent to which advanced emission reduction technologies are to be used.

(H) The degree to which funds are leveraged from other sources.

(I) The degree to which the project reduces air pollutants or air contaminants in furtherance of achieving state and federal ambient air quality standards and reducing toxic air contaminants.

(J) The total emission reductions a project would achieve over its lifetime per state dollar invested.

(K) Whether an emissions reduction is likely to occur in a location where emissions sources in the area expose individuals and population groups to elevated emissions that result in adverse health effects and contribute to cumulative human exposures to pollution.

(c) The state board shall ensure that state bond funds are supplemented and matched with funds from federal, local, and private sources to the maximum extent feasible.

39626. (a) (1) The state board shall develop guidelines by December 31, 2007, consistent with the requirements of this chapter, to implement Section 39625.5, in consultation with stakeholders, including, but not limited to, local air quality management and air pollution control districts, metropolitan planning organizations, port authorities, shipping lines, railroad companies, trucking companies, harbor craft owners, freight distributers, terminal operators, local port community advisory groups, community interest groups, and airports. The guidelines shall, at a minimum, include all of the following:

(A) An application process for the funds, and any limits on administrative costs for the recipient agency, including an administrative cost limit of up to 5 percent.

(B) A requirement for a contribution of a specified percentage of funds leveraged from other sources or in-kind contributions toward the project.

(C) Project selection criteria.

(D) The method by which the state board will consider the air basin's status in maintaining and achieving state and federal ambient air quality standards and the public health risk associated with goods movement-related emissions and toxic air contaminants.

(E) Accountability and auditing requirements to ensure that expenditure of bond proceeds, less administrative costs, meets quantifiable emission reduction objectives in a timely manner, and to ensure that the emission reductions will continue in California for the project lifetime.

(F) Requirements for agreements between applicants and recipients of funds executed by the state board related to the identification of project implementation milestones and project completion that ensure that if a recipient fails to accomplish project milestones within a specified time period, the state board may modify or terminate the agreement and seek other remedies as it deems necessary.

(2) Prior to the adoption of the guidelines, the state board shall hold no less than one public workshop in northern California, one public workshop in the Central Valley, and one public workshop in southern California.

(b) For each fiscal year in which funds are appropriated for the purposes of this chapter, the state board shall issue a notice of funding availability no later than November 30. For the 2007-08 fiscal year, if funds are appropriated for the purposes of this chapter, the state board shall issue a notice of funding upon adoption of the guidelines described in subdivision (a).

(c) (1) After applications have been submitted and reviewed for consistency with the requirements of this chapter and the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, the state board shall compile and release to the public a preliminary list of all projects that the state board is considering for funding and provide adequate opportunity for public input and comment.

(2) The state board shall hold no less than one public workshop in northern California, one public workshop in the Central Valley, and one public workshop in southern California to discuss the preliminary list. This requirement shall not apply to the funds appropriated in the 2007-08 fiscal year.

(3) After the requirements of paragraphs (1) and (2) are met, the state board shall adopt a final list of projects that will receive funding at a regularly scheduled public hearing.

(d) Nothing in this chapter authorizes the state board to program funds not appropriated by the Legislature.

39626.5. (a) A project shall not be funded pursuant to this chapter unless both of the following requirements are met:

(1) The project is sponsored by an applicant.

(2) The project is consistent with any comprehensive local or regional plans or strategies to reduce emissions from goods movement activities in its jurisdiction.

(b) Notwithstanding Section 16304.1 of the Government Code, an applicant receiving funds pursuant to this chapter shall have up to two years from the date that the funds

are allocated to the applicant pursuant to a grant agreement to award the contract for implementation of a project, or the funds shall revert to the California Ports Infrastructure, Security, and Air Quality Improvement Account for allocation as provided in paragraph (2) of subdivision (c) of Section 8879.23 of the Government Code upon appropriation by the Legislature. Funds not liquidated within four years of the date of the award of the contract between the applicant and the contractor shall revert to the California Ports Infrastructure, Security, and Air Quality Improvement Account for allocation as provided in paragraph (2) of subdivision (c) of Section 8879.23 of the Government Code upon appropriation by the Legislature. Returned funds or unspent funds from obligated contracts received by the applicant prior to the end of the four-year liquidation period may be awarded by the applicant to fund other equipment projects included on the same competitively ranked list approved by the state board pursuant to the grant agreement, or, if there are no other eligible projects included on that list, shall be returned to the state board for reallocation to an applicant by the state board pursuant to guidelines developed and adopted by the state board through a public process. These guidelines shall give first priority to projects that are both in the same emission source category and in the same trade corridor as the original project, and second priority to projects that are only in the same trade corridor as the original project. All funds awarded by the applicant shall be liquidated within four years of the date of the award of the original contract or shall revert to the California Ports Infrastructure, Security, and Air Quality Improvement Account for allocation provided in paragraph (2) of subdivision (c) of Section 8879.23 of the Government Code upon appropriation by the Legislature.

(c) Of the amount appropriated in Item 3900-001-6054 of the Budget Act of 2007, not more than twenty-five million dollars ($25,000,000) shall be available to the state board for the purpose of executing grant agreements directly with ports, railroads, or local air districts for eligible projects to achieve the earliest possible health risk reduction from the emission sources identified in subdivision (c) of Section 39625.1. It is the intent of the Legislature that funds allocated pursuant to this subdivision be distributed pursuant to the guidelines adopted by the state board under Section 39626, and that the state board provide sufficient opportunity for the public to review and comment on any projects proposed to be funded pursuant to this subdivision.

39627. The state board may seek reimbursement for program administration costs annually through an appropriation in the Budget Act from funds available pursuant to paragraph (2) of subdivision (c) of Section 8879.23 of the Government Code.

39627.5. The state board shall submit an annual report to the Legislature summarizing its activities related to the administration of this chapter with the Governor's proposed budget, on January 10, for the ensuing fiscal year. The summary shall, at a minimum, include a description of projects funded pursuant to this chapter, the amount of funds allocated for each project, the location of each project, the status of each project, and a quantitative description of the emissions reductions achieved through the project or program. The state board shall include in this report a description of any changes to the scope of grant agreements entered into to allocate funds to an applicant or changes to the award amounts described in a grant agreement.

APPENDIX B
DECEMBER 2012 STATUS REPORT

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Proposition 1B: Goods Movement Emission Reduction Program
DECEMBER 2012 SEMI-ANNUAL STATUS REPORT

This status report provides an update on implementation of the $1 billion Proposition 1B: Goods Movement Emission Reduction Program (Program) to reduce emissions and health risk from freight operations in California's priority trade corridors through incentives. Consistent with State law, the Program' guidelines for implementation (Guidelines) and related documents detail the grant requirements for the Air Resources Board (ARB or Board), participating local agencies, and equipment owners (see Program website at http://www.arb.ca.gov/gmbond).

ARB adopts the Guidelines, and then solicits, awards, funds, and oversees grants to local agencies like air districts and seaports. The local agencies offer grants in a competitive process to diesel equipment owners to co-fund the upgrade of diesel equipment to cleaner technologies, ahead of or beyond any regulatory requirements to do so. To ensure accountability and effective use of these public funds, the local agencies: solicit for eligible projects, review applications, inspect the old equipment, provide data to competitively rank each piece of equipment based on emission reductions and cost-effectiveness, sign contracts with equipment owners, inspect the upgraded equipment, make payment for the cleaner technology, and track/report on funded projects.

The information in this report is based on the local agencies' semi-annual reports as of September 30, 2012 except where noted. The tables following the narrative in this report describe the progress on each grant using funds received from appropriations for Fiscal Years (FY) 2011-12, 2008-09 and 2007-08 including the grant award, the number of trucks or other equipment being upgraded, and estimated emission reductions.

Update to Program Guidelines

ARB staff is proposing updates to the Guidelines, which is part of a periodic process to revisit the Program requirements. ARB will hold a public hearing to consider testimony and adoption of the proposed update to the Guidelines on January 25, 2013.

The proposed update to the Program Guidelines was developed in conjunction with the local agencies and other stakeholders. ARB staff released a Draft Concept Paper in October 2012 and held three public workshops statewide (Sacramento, the Central Valley, and Southern California), in November 2012 to solicit input from local agencies, the trucking industry, railroads, shippers, equipment manufacturers, and environmental representatives. The proposed update to the Guidelines incorporates many of the suggestions received as a result of outreach and implementation.

The proposed updates include administrative changes to streamline the process and improve effectiveness, and modifications to project specifications. Changes to the latter are based on advances in technology, changes in equipment costs, regulatory actions, and other new information. This proposed update acknowledges that the nature of eligible projects has changed, due to the effect of the regulations on the Program. There are fewer projects that are "early" to the regulation; therefore in this proposed

update, the Program is moving towards funding eligible projects with emission reductions that are "extra."

The proposed changes also reflect a provision for shore power projects to receive progress payments based on the Governor's veto message of Senate Bill 234. The message directed ARB to allow for quarterly reimbursement for up to 80 percent of eligible project costs, provided the equipment owner has expended the non-State match funding for each berth and is in compliance with the equipment project contract. Additional flexibility is provided to small ports with less than 10 berths.

Available Funding

Each budget appropriation authorizes ARB to use a specific amount of bond funding for this Program, within statutory timeframes. But the appropriation does not provide any cash for this purpose. Therefore, we depend on the receipt of proceeds from State bond sales for new projects.

The entire $1 billion has been appropriated in State budgets, with $980 million to ARB for this Program and $20 million set aside by the control agencies to cover bond issuance and oversight costs. To date, ARB has received almost $587 million in cash from multiple bond sales and commercial paper; the Board has allocated all of these funds under its FY2007-08 through FY2011-12 appropriation authority for local agency projects and ARB's administration costs over multiple years. This leaves a balance of roughly $393 million that ARB needs new bond cash to implement new projects.

Implementation of FY2008-09 and FY2011-12 Funds

In June 2010, the Board awarded $200 million in available cash primarily for truck projects and ships at berth/cargo handling equipment projects, and with smaller grants for locomotive and harbor craft projects.

In December 2011, the Board awarded $100.8 million from the Fall 2011 bond sale and also allocated potential proceeds from a Spring 2012 bonds sale; all of these funds were used for truck projects. Funds from the Fall bond sale include $30.3 million for drayage truck projects and $5 million for loan guarantees, plus $65.5 million for other truck projects covered under grant agreements. ARB received approximately $18 million to complete the truck projects and for ARB's administration costs from the Spring bond sale. The funds have been allocated to local agencies for truck projects in accordance with the December 2011 Board approval.

Trucks. ARB signed grant agreements with six local agencies in the four trade corridors for the Phase 1 truck projects in February 2011. The local agencies held coordinated statewide solicitations in early 2011, which included extensive outreach, which resulted in a significant demand for Program funds. The local agencies have signed contracts with the majority of the equipment owners and are in the process of signing contracts with the remaining equipment owners. ARB received additional funds

in late 2011 which were used to provide funds to the local agencies for Phase 2 truck projects which were awarded in December 2011.

Also in December 2011, ARB set aside $66.6 million for 2,100 potentially eligible drayage truck projects. These funds are being used to replace drayage trucks that are in compliance with the first phase of the Drayage Truck Regulation but must upgrade to comply with the second phase by January 1, 2014. Based on the initial response to the request for applications and the number of projects that were contracted, there is a demand for Program funds of $24.7 million. The remaining funds were made available for other (non-drayage) truck projects which had a significant demand in excess of available funds.

Ships at Berth, Locomotives, and Commercial Harbor Craft. Local agencies have signed contracts with equipment owners, based on ARB-approved ranked lists and all projects are in process.

Implementation of FY2007-08 Funds

The first year (FY2007-08) funds were used for projects to upgrade trucks, locomotives, and ships at berth. All of these projects ($232 million) were suspended for 6 to 14 months due to the December 2008 "stop work" order on bond funded programs, which resulted in an extended delay from time of application to contract. This led to some funds being unused by the local agencies. ARB and the local agencies amended grant agreements from undersubscribed grants to oversubscribed grants. The truck, ships at berth, and the majority of the locomotive projects have all been completed; the remaining locomotive project is expected to be completed in 2014.

ARB Expenditures

ARB has paid out approximately $510 million to local agencies and for ARB's administration costs through December 2012. Approximately $70 million will be paid to the local agencies in the first half of 2013 primarily for ships at berth projects and will be used to pay for ARB's administration costs for FY2012-13. The remaining $7 million will be paid out in 2014 to close-out the ships at berth and locomotive projects.

Project Results

The Program bond monies are leveraging substantial match funding from private, local, and federal sources – more than one match dollar for every Program dollar invested.

Trucks. The local agencies completed the truck projects from the FY2007-08 funds by the end of 2011 with more than 5,000 cleaner trucks operating in the four trade corridors. The local agencies have signed contracts with the majority of equipment owners to upgrade about 5,700 trucks covered by the FY2008-09 and FY2011-12 grants. A significant number of these trucks must be operational by December 31, 2012

to comply with the Program's requirement that upgrades be early or extra to the Statewide Truck and Bus Regulation.

Ships at Berth, Locomotives, and Commercial Harbor Craft. The Bay Area District's early grant project to install grid-based electrical power for three ship berths at the Port of Oakland has been completed and the installation of power at nine additional berths is in the beginning stages. The South Coast District is implementing projects to install shore-side power for 25 berths at the Ports of Long Beach, Los Angeles, and Hueneme. All of the new ships at berth projects are scheduled to be operational in 2013.

The Sacramento and South Coast Districts have completed the upgrade of 18 locomotives operating in the Central Valley and the Los Angeles/Inland Empire trade corridors. An additional seven locomotives operating in the Los Angeles/Inland Empire trade corridor will be operational in early to late 2014. The San Diego District signed a contract for a commercial harbor craft project which is expected to be operational in early 2013.

Project Benefits

When implemented, we expect projects included in this report will reduce at least 4.8 million pounds or 2,400 tons of particulate matter (PM), plus 132 million pounds or 66,000 tons of nitrogen oxides (NOx), over the life of their grant term (e.g., 2 to 5 years for trucks and 10 years for ships at berth).

Project Status by Grant Agreement

The tables on the following pages present the status of each grant based on information from the September 30, 2012 local agency semi-annual reports. Subsequent to the submission of the semi-annual reports, ARB executed grant amendments with some of the local agencies to transfer additional unused port truck funds and add the funds allocated from the Spring 2012 bond sale. This information will be updated in subsequent semi-annual reports.

This report shows the information by trade corridor and within each trade corridor by applicable appropriation year. Additionally, we have combined the information for the FY2008-09 and FY2011-12 grants for other truck projects because these grants cover projects from the same statewide solicitation and the same ranked lists, although the funds are from different fiscal year appropriations. Projects are selected for funding on the basis of their competitive ranking, which reflects cost-effectiveness and emission reduction benefits. Since each ranked list may be updated to reflect project fallout or revised information, we preserve the overall ranking hierarchy by maintaining a single project list rather than separating it by fiscal year grant.

LOS ANGELES/INLAND EMPIRE TRADE CORRIDOR – South Coast AQMD

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2011-12					
Priority Drayage Reserve[1]	Replace old dirty trucks with newer clean models serving ports and railyards. (G11GMLP1)	$4,499,250	2,000	1,319,000	District has signed contracts with owners to scrap/replace 143 trucks. 58 upgraded trucks are operational and the remaining 85 trucks must be operational by the end of 2012. Grant amount reflects a reduction in funds of $572,250 that were transferred to the District's Grant G11GMLT1.
FY2011-12 & FY2008-09					
Other Trucks[1]	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G11GMLT1) (G08GMLT1)	$104,222,983 including: $64,334,412 $39,888,571	691,000	17,852,000	District has signed contracts with owners to retrofit 531 trucks, scrap/replace 1,470 trucks, and is in the process of signing contracts for about 350 trucks and one truck stop electrification project. 264 upgraded trucks are operational. District expects the remaining projects to be operational by the end of 2012 for most large fleets and by the end of 2013 for small fleets. Grant amount reflects an increase in funds of $572,250 transferred from the District's Grant G11GMLP1 and $10,240,400 from additional funds received from the Spring 2012 bond sale
FY2008-09					
Ships at Berth	Eliminate or reduce emissions from ships at berth. (G08GMLS1)	$59,973,125	373,000	21,841,000	District has signed contracts to install shorepower equipment for a total of 25 berths (12 for Port of Long Beach, 10 for Port of Los Angeles, three for Port of Hueneme). Construction started in Fall 2012 and projects are expected to be operational by December 2013.
Locomotives	Replace old dirty locomotives with newer clean models. (G08GMLL1)	$4,635,000	29,000	315,000	District has signed a contract to upgrade six locomotives and expects the projects to be operational by December 2014.

LOS ANGELES/INLAND EMPIRE TRADE CORRIDOR – South Coast AQMD (continued)

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2007-08					
Drayage Trucks	Replace old dirty trucks serving the Ports of Los Angeles and Long Beach with newer clean models. (G07GMLP1)	$6,930,000	72,000	1,104,000	District has completed the grant to scrap 132 old trucks and replace them with new natural gas trucks meeting the cleanest 2010 emission standards. All 132 trucks are operational.
	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models serving the railyards. (G07GMLP2)	$2,625,000	34,000	577,000	District has completed the grant to retrofit 2 trucks with soot filters and to scrap 50 old trucks and replace them with much cleaner trucks. All 52 upgraded trucks are operational.
	Replace old dirty trucks serving the Ports of Los Angeles and Long Beach with newer clean models. (G07GMLP3-03)	$68,539,800	557,000	10,194,000	District has completed this project to scrap 1,312 old trucks and replace them with much cleaner trucks. All 1,312 trucks are operational.
Other Trucks	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMLT1)	$6,877,500	104,000	1,638,000	District has completed the grant to scrap 131 old trucks and replace them with much cleaner trucks. All 131 trucks are operational.
	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMLT2)	$43,018,900	481,000	13,294,000	District has completed the grant to retrofit 33 trucks with soot filters and to scrap 822 old trucks and replace them with much cleaner trucks. All 855 trucks are operational. The truck stop electrification project has been cancelled as it did not meet the operational deadline.
Locomotives	Replace old dirty locomotives at railyards with newer clean models. (G07GMLL1)	$3,090,000	37,000	1,007,000	Three locomotives have been upgraded with much cleaner engines and one locomotive is expected to be operational in 2014.

LOS ANGELES/INLAND EMPIRE TRADE CORRIDOR – Port of Long Beach

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2007-08					
Drayage Trucks	Replace old dirty trucks serving the Ports of Los Angeles and Long Beach with newer clean models. (G07GMLP3)	$3,550,000	62,000	609,000	Port has completed the grant to scrap 67 old trucks and replace them with much cleaner trucks. All 67 trucks are operational.
FY2011-12 Corridor Subtotal[1]		$4,499,250	2,000	1,319,000	
FY2011-12 & 2008-09 Corridor Subtotal[1]		$104,222,983	691,000	17,852,000	
FY2008-09 Corridor Subtotal		$64,608,125	402,000	22,156,000	
FY2007-08 Corridor Subtotal		$134,631,200	1,347,000	28,423,000	
Corridor Total[1]		$307,961,558	2,442,000	69,750,000	

[1]Totals reflect the grant amounts and emission reductions based on the grand agreement amendments executed after the submission of the 9/30/12 local agency semi-annual reports.

CENTRAL VALLEY TRADE CORRIDOR – San Joaquin Valley APCD

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2011-12 & FY2008-09					
Other Trucks[1]	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G11GMCT1) (G08GMCT1)	$67,403,515 including: $22,676,212 $44,727,303	584,000	15,311,000	District has signed contracts with owners to retrofit 88 trucks and scrap/replace 948 trucks, and is in the process of signing contracts for about 300 trucks and one truck stop electrification project. 145 upgraded trucks are operational. District expects the remaining projects to be operational by the end of 2012 for most large fleets and by the end of 2013 for small fleets. Grant amount reflects an increase in funds of $5,509,600 in additional funds received from the Spring 2012 bond sale.
FY2007-08					
Other Trucks	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMCT1)	$4,882,500	113,000	1,364,000	District has completed the grant to retrofit 10 trucks with soot filters and to scrap 93 old trucks and replace them with much cleaner trucks. All 103 trucks are operational.
	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMCT3)	$40,824,420	609,000	14,319,000	District has completed the grant to retrofit 12 trucks with soot filters and to scrap 789 old trucks and replace them with much cleaner trucks. All 801 trucks are operational.

CENTRAL VALLEY TRADE CORRIDOR – Sacramento Metropolitan AQMD

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2011-12 & FY2008-09					
Other Trucks	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G11GMCT2) (G08GMCT2)	$10,558,879 including: $752,053 $9,806,826	57,000	1,691,000	District has signed contracts with owners to retrofit 22 trucks and scrap/replace 209 trucks. 126 upgraded trucks are operational. District expects the remaining projects to be operational by the end of 2012 for most large fleets and by the end of 2013 for small fleets.
FY2007-08					
Other Trucks	Replace old dirty trucks with newer clean models. (G07GMCT2)	$102,847	1,000	27,000	District has completed the grant to scrap two old trucks and replace them with much cleaner trucks. Both trucks are operational.
	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMCT4)	$4,640,774	43,000	1,016,000	District has completed the grant to scrap 96 old trucks and replace them with much cleaner trucks. All 96 trucks are operational.
Locomotives	Replace old dirty long-haul locomotives with new clean models. (G07GMCL1)	$10,300,000	295,000	2,844,000	District has completed the grant to repower 15 line haul locomotives with much cleaner engines. All 15 locomotives are operational and are expected to routinely travel between the Central Valley and the Los Angeles/Inland Empire.
FY2011-12 & 2008-09 Corridor Subtotal[1]		$77,962,394	641,000	17,002,000	
FY2007-08 Corridor Subtotal		$60,750,541	1,061,000	19,570,000	
Corridor Total[1]		$138,712,935	1,702,000	36,572,000	

[1]Totals reflect the grant amounts and emission reductions based on the grand agreement amendments executed after the submission of the 9/30/12 local agency semi-annual reports.

BAY AREA CORRIDOR – Bay Area AQMD

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2011-12					
Priority Drayage Reserve1	Replace old dirty trucks with newer clean models serving ports and railyards. (G11GMBP1)	$20,191,500	3,000	6,474,000	District has signed contracts with owners to scrap/replace 708 trucks. Four upgraded trucks are operational and the remaining trucks must be operational by December 2012 Grant amount reflects a reduction in funds of $5,076,750 that were transferred to the District's truck grant G11GMBT1.
FY2011-12 & FY2008-09					
Other Trucks[1]	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G11GMBT1) (G08GMBT1)	$20,819,963 including: $13,225,760 $7,594,203	118,000	3,097,000	District has signed contracts with owners to retrofit 7 trucks, scrap/replace 271 trucks, one truck stop electrification project, and is in the process of signing contracts for about 120 trucks. District expects the remaining projects to be operational by the end of 2012 for most large fleets and by the end of 2013 for small fleets. Grant amount reflects an increase in funds of $5,076,750 that were transferred from the District's truck grant G11GMBP1.
FY2008-09					
Ships at Berth	Eliminate or reduce emissions from ships at berth and/or cargo equipment at ports and intermodal railyards. (G08GMBS1)	$20,000,000	107,000	6,278,000	District has signed contracts to install shorepower equipment for a total of nine berths (eight for Port of Oakland, one for Ports America Outer Harbor Terminal). Construction has begun and projects are expected to be operational by December 2013.

BAY AREA CORRIDOR – Bay Area AQMD (continued)

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds) PM	NOx	Current Project Status
FY2007-08					
Drayage Trucks	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMBP1)	$14,526,891	190,000	1,897,000	District has completed the grant to retrofit 889 trucks with soot filters and to scrap 203 old trucks and replace them with much cleaner trucks. All 1,092 trucks are operational.
Other Trucks[2]	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMBT1)	$10,462,200	87,000	1,970,000	District has completed the grant to retrofit 13 trucks with soot filters and to scrap 198 old trucks and replace them with much cleaner trucks. All 211 trucks are operational.
Ships at Berth	Install grid-based shoreside electrical power at 3 berths at the Port of Oakland so ships can plug in and turn off their engines while docked. (G07GMBS1)	$2,422,290	20,000	1,164,000	District has completed the grant to provide shore power at three berths with the first ship plugging into the grid in May 2011.
Locomotives	Replace old dirty locomotives at railyards with newer clean models. (G07GMBL1)	$0	0	0	Grant terminated and funds transferred to the existing port truck grant G07GMBP1, at the District's request.
FY2011-12 Corridor Subtotal[1]		$20,191,500	3,000	6,474,000	
FY2011-12 & 2008-09 Corridor Subtotal[1]		$20,819,963	118,000	3,097,000	
FY2008-09 Corridor Subtotal		$20,000,000	107,000	6,278,000	
FY2007-08 Corridor Subtotal[2]		$27,411,381	297,000	5,031,000	
Corridor Total[1,2]		$88,422,844	525,000	20,880,000	

[1]District reflect the grant amounts and emission reductions based on the grand agreement amendments executed after the submission of the 9/30/12 local agency semi-annual reports

[2]Includes the $0.4 million from FY2008-09 funds used to supplement the Bay Area District's grant G07GMBP1 for port trucks in 2010.

SAN DIEGO/BORDER TRADE CORRIDOR – San Diego APCD

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2011-12 & FY2008-09					
Other Trucks	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G11GMST1) (G08GMST2)	$11,376,764 including: $4,799,464 $6,577,300	79,000	1,898,000	District has signed contracts with owners to retrofit 85 trucks and scrap/replace 231 trucks. 101 upgraded trucks are operational. District expects the remaining projects to be operational by the end of 2012 for most large fleets and by the end of 2013 for small fleets.
FY2008-09					
Commercial Harbor Craft	Replace old dirty engines in harbor craft with newer clean engines. (G08GMSH1)	$115,286	600	11,000	District has signed a contract to upgrade one harbor craft vessel and the project will be operational in early 2013.
FY2007-08					
Drayage Trucks	Retrofit or replace trucks serving the Port of San Diego. (G07GMSP1)	$0	0	0	Grant terminated and funds transferred to the existing port truck grant G07GMSP2, at the District's request.
	Replace old dirty trucks serving the Port of San Diego with newer clean models. (G07GMSP2)	$5,143,950	31,000	680,000	District has completed the grant to scrap 98 trucks and replace them with much cleaner trucks. All 98 trucks are operational.
Other Trucks	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMST2)	$1,680,000	13,000	332,000	District has completed the grant to scrap 32 trucks and replace them with much cleaner trucks. All 32 trucks are operational.

SAN DIEGO/BORDER TRADE CORRIDOR – Imperial County APCD

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2011-12 & FY2008-09					
Other Trucks	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G11GMST2) (G08GMST1)	$8,174,701 including: $5,174,701 $3,000,000	67,000	1,638,000	District has signed contracts with owners to scrap/replace 10 trucks, and is in the process of signing contracts for 170 trucks and one truck stop electrification project. Nine upgraded trucks are operational. District expects the remaining projects to be operational by the end of 2012 for most large fleets and by the end of 2013 for small fleets.
FY2007-08					
Other Trucks	Retrofit trucks with soot filters and replace old dirty trucks with newer clean models. (G07GMST3)	$2,573,799	23,000	433,000	District has completed the grant to scrap 51 trucks and replace them with much cleaner trucks. All 51 trucks are operational.

SAN DIEGO/BORDER TRADE CORRIDOR – Port of San Diego

Fiscal Year/ Category	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2007-08					
Ships at Berth	Install grid-based shore power at the Port of San Diego. (G07GMSS1)	$0	0	0	Grant terminated at the Port's request, and funds transferred to the San Diego District's existing port truck grant G07GMSP2.
FY2011-12 & 2008-09 Corridor Subtotal		$19,551,465	146,000	3,536,000	
FY2008-09 Corridor Subtotal		$115,286	600	11,000	
FY2007-08 Corridor Subtotal		$9,397,749	67,000	1,445,000	
Corridor Total		$29,064,500	213,600	4,992,000	

STATE AGENCY – LOAN ASSISTANCE – Priority Drayage Reserve only

State Agency	Project Description	Grant Amount	Emission Reductions (pounds)		Current Project Status
			PM	NOx	
FY2011-12					
ARB	Loan assistance to replace old dirty trucks with newer clean models serving ports and railyards.	$5,000,000	TBD	TBD	Loan assistance to help replace drayage trucks funded under the priority drayage reserve through the South Coast and Bay Area Districts. Loan assistance is improved access to financing through the California Capital Access Program with funds used for a loan loss reserve account if a truck owner defaults on their loan. ARB will refine estimates for emission reductions after the projects become operational. Any unused funds will be used to fund local agencies' other truck projects. 7 truck projects have utilized the loan assistance as of September 31, 2012.

TOTALS – ALL PROJECTS FROM ALL FISCAL YEAR APPROPRIATIONS

Fiscal Year Appropriation	Description	Grant Amount	PM (lbs)	NOx (lbs)
FY2011-12	Priority Drayage Reserve Projects	$24,690,750	5,000	7,793,000
	ARB Loan Assistance Program	$5,000,000	TBD	TBD
FY2011-12 & FY2008-09	Other Truck Projects[1]	$222,545,805	1,596,000	41,487,000
FY2008-09	Non-Truck Projects	$84,723,411	509,600	28,445,000
FY2007-08	All Projects[2]	$232,190,871	2,772,000	54,469,000
ALL FISCAL YEARS	**TOTAL Project Funds**	**$569.2 million**	**4,882,600 lbs or 2,441 tons**	**132,194,000 lbs or 66,097 tons**
Funding Subtotals by Fiscal Year Appropriation:				
FY2011-12 Only	Grants to Local Agencies[3]	$135,653,352		
	ARB Loan Assistance Program	$5,000,000		
	ARB Administration *(may also be used in future fiscal years)*	$4,700,000		
FY2010-11 Only	ARB Administration	$3,250,000		
FY2009-10 Only	ARB Administration	$3,250,000		
FY2008-09 Only	Grants to Local Agencies[4]	$196,317,614		
	ARB Administration	$2,960,000		
FY2007-08 Only	Grants to Local Agencies[5]	$232,190,871		
	ARB Administration	$3,240,000		
ALL FISCAL YEARS	**Project & ARB Administration Funds**	**$586.6 million**		

[1]Emission reduction totals shown above for "Other Truck" projects include projects funded by FY2008-09 and FY2011-12, because these projects are being funded from the same ranked lists.

[2]FY2007-08 emission reductions are based on the actual amount of FY2007-08 funds that were used; excluding unused funds that were re-directed to FY2011-12 local agency truck grants.

[3]Total FY2011-12 Grants to Local Agencies include:

- $6.0 million from Spring 2010 bonds sales previously reserved for ARB administration funds that were re-directed to FY2011-12 local agency truck grants;
- $14.8 million in unused funds from FY2007-08 grants that were re-directed to FY2011-12 local agency truck grants; and
- $3.3 million in unused funds from FY2008-09 grants that were re-directed to FY2011-12 local agency truck grants.

[4]Total FY2008-09 Grants to Local Agencies exclude:

- $0.4 million in FY2008-09 funds used to supplement the Bay Area District's grant G07GMBP1 for port trucks in 2010; and
- $3.3 million in unused funds from FY2008-09 grants that were re-directed to FY2011-12 local agency truck grants.

[5]Total FY2007-08 Grants to Local Agencies:

- Include the $0.4 million from FY2008-09 funds used to supplement the Bay Area District's grant G07GMBP1 for port trucks in 2010; and
- Exclude the $14.8 in unused funds from FY2007-08 grants that were re-directed to FY2011-12 local agency truck grants.

TOTALS – ALL PROJECTS BY TRADE CORRIDOR[1]

Trade Corridor	Amount ($ millions)	PM (lbs)	NOx (lbs)
Los Angeles/Inland Empire	$307,961,558	2,442,000	69,737,000
Central Valley	$138,712,935	1,702,000	36,572,000
Bay Area	$88,422,844	525,000	20,880,000
San Diego/Border	$29,064,500	213,600	4,992,000
ARB Loan Assistance	$5,000,000		
ARB Administration	$17,400,000		
TOTAL	**$586.6 million**	**4,882,600 lbs or 2,441 tons**	**132,194,000 lbs or 66,097 tons**

[1]The total dollar amounts and emission reductions are based on the grant agreements and any amendments as of December 2012.

PROPOSITION 1B:
GOODS MOVEMENT EMISSION REDUCTION PROGRAM

Proposed Update to
GUIDELINES FOR IMPLEMENTATION

Board Consideration: January 25, 2013

California Environmental Protection Agency

Air Resources Board

NOTES TO THE READER

This proposed update to the Proposition 1B: Goods Movement Emission Reduction Program Guidelines for Implementation is intended to completely replace the Guidelines adopted by the Air Resources Board on March 25, 2010.

Proposed deletions of the original text are shown in ~~strikeout~~ and proposed additions are shown in underline, except for minor grammatical and capitalization changes, and in the Program's overview (Chapter I).

The Air Resources Board will hold a public hearing to consider public testimony and adoption of the proposed update to the Guidelines on:

January 25, 2013
9:00 a.m.
South Coast Air Quality Management District Office
21865 East Copley Drive
Diamond Bar, California 91765

Please see the Program website at: http://www.arb.ca.gov/gmbond for the Hearing Notice and the accompanying Staff Report that describes the basis for the proposed changes to the Guidelines.

Once the Board acts, ARB staff will publish a final, clean version of these Guidelines (without the strikeout/underline markings) and post it on the Program website.

DOCUMENT AVAILABILITY

Electronic copies of this document and related materials can be found at: http://www.arb.ca.gov/gmbond. Alternatively, paper copies may be obtained from the Air Resources Board's (ARB) Public Information Office, 1001 I Street, 1st Floor, Visitors and Environmental Services Center, Sacramento, California, 95814, (916) 322-2990.

If you need this document in an alternative format (i.e., Braille, large print) or another language, please contact Ms. Heather Jackson at (916) 322-8267 or hbjackso@arb.ca.gov. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

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ONGOING CLARIFICATION OF PROGRAM REQUIREMENTS

ARB staff clarifications regarding specific issues that may arise after publication of the final Guidelines will be made available on the Program website to assist agencies with implementation.

DISCLAIMER

This report has been reviewed by ARB staff and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of ARB the, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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I. Overview

A. Introduction

Emissions from the diesel engines in trucks, locomotives, ships, harbor craft, and cargo handling equipment contribute to local, regional, and global air pollution. The diesel pollution from goods movement/freight transport operations greatly impacts the health of community residents near ports, railyards, distribution centers, and roads with high truck traffic. Diesel emissions are also a major cause of the high regional ozone and fine particle levels that harm millions of Californians today.

Goods movement sources contribute to California's air pollution challenges. The Los Angeles/Inland Empire region has the largest concentration of goods movement/ freight transport facilities (e.g., ports and railyards), with high near-source health risks and high levels of regional ozone and fine particulate matter (PM2.5) pollution. In the Central Valley, the facilities are less concentrated, but there is relatively more through truck and rail traffic that contribute to the region's harmful ozone and PM2.5 levels. In the Bay Area, regional ozone and PM2.5 levels are much lower, but truck, port, and railyard activity adjacent to neighborhoods contributes to high localized health risks. In the San Diego/Border region, trucks and operations at the port contribute to regional ozone and PM2.5 pollution above the State of California (State) standards.

Proposition 1B authorized the Legislature to appropriate $1 billion in bond funding to the Air Resources Board (ARB or Board) to quickly reduce air pollution emissions and health risks from freight movement along California's priority trade corridors. The State Fiscal Year (FY) 2007-08 budget included implementing legislation, via Senate Bill 88 (SB 88) (Chapter 181, Statutes of 2007), that created the Goods Movement Emission Reduction Program (Program). Assembly Bill 201 (AB 201) (Chapter 187, Statutes of 2007) included a minor clarification. These bills are codified in the Health and Safety Code, section 39625 et seq. SB 88 required ARB to adopt Guidelines to ensure the Program achieves the statutory objectives.

The implementing statutes directed ARB to maximize the emission reduction benefits and achieve the earliest possible health risk reduction in communities heavily impacted by goods movement. This Program supplements regulatory actions and other incentives to cut diesel emissions. By statute, the Program can only fund emission reductions "not otherwise required by law or regulation." Key pollutants targeted by the Program include diesel particulate matter (diesel PM), a toxic air contaminant, and nitrogen oxides (NOx) that contribute to the formation of both PM2.5 and ozone. The projects funded under the Program also provide co-benefits by reducing greenhouse gases and black carbon emissions that contribute to climate change.

While the State budget appropriates funding for the Program, ARB must receive cash from the sale of bonds or a loan from the Pooled Money Investment Board to implement grants or loan programs. ARB awards grants to fund projects proposed by local agencies that are involved in freight movement or air quality improvements associated with goods movement activities. Examples of local agencies include air pollution control and air quality management districts (air districts), ports, and regional transportation agencies in the trade corridors. The local agencies are responsible for providing financial incentives to owners of equipment used in freight movement to upgrade to cleaner technologies, consistent with the Guidelines adopted by ARB. Bond funds flow via grant agreements from ARB to local agencies, then to equipment owners via contracts or other binding agreements with those local agencies. Throughout the Program, there is competition based on the projected emission reductions and reductions per State dollar invested to ensure the most beneficial projects are funded. ARB may also award funds to any State agency (including ARB itself) for the purpose of administering a loan or loan guarantee program via an interagency agreement.

ARB staff developed the initial *Proposition 1B: Goods Movement Emission Reduction Program Guidelines for Implementation* (Guidelines) in consultation with stakeholders, including: air districts, metropolitan planning organizations, port authorities, shipping lines, railroad companies, trucking companies, harbor craft owners, freight distributors, terminal operators, local port community advisory groups, community interest groups, and airports. The Guidelines were designed to fund qualifying projects that reduce emissions and health risks, incorporate simplicity and efficiency, ensure cost-effectiveness, leverage other funding sources, and provide transparency and accountability.

When the Board adopted the initial Guidelines on February 28, 2008, the Board directed ARB to reassess those Guidelines and bring appropriate updates to the Board following each appropriation of funding. Development of updates to the Guidelines are based on evaluating advances in technology, changes in equipment costs, regulatory actions, demand for Program funds, and other new information that influences the design of project specifications. The process involves the release of a concept paper and workshops to obtain feedback from stakeholders.

The first update, approved on March 25, 2010, incorporated interim changes made via Board Resolution, Executive Orders, and ARB staff clarifications for projects receiving FY2007-08 (Year 1) funds. It also revised the project specifications for FY2008-09 (Year 2) and FY2011-12 (Year 3) funds. The updated 2010 Guidelines superseded the February 28, 2008 Guidelines, except for the limited provisions identified for Year 1 funds (see Chapter II.A.2.).

This proposed update to the 2010 Guidelines includes changes to project specifications, which acknowledges fewer opportunities for conventional, cleaner diesel equipment replacing older diesel equipment due to in-use regulations. The nature of eligible projects has changed, due to the effect of the regulations on the Program. There are fewer projects that are "early" to the regulations; therefore in this proposed update, the Program is moving towards funding eligible projects with emission reductions that are "extra." Additionally, ARB staff is proposing to provide additional funding for zero-emission technologies to encourage equipment owners to purchase the cleanest equipment. This proposed update also incorporates interim changes made via Board Resolution, Executive Orders, and ARB staff clarifications for projects receiving Year 2 and Year 3 funds. The updated 2013 Guidelines will supersede the March 25, 2010 Guidelines, except for the limited provisions identified for Year 1 through Year 3 funds (see Chapter II.A.2.).

B. Authority

The legal authority for the Program is found in the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, also known as Proposition 1B, pursuant to the implementing statutes discussed below. Executive Order S-02-07 provided additional direction on bond accountability and the 2007-08 budget bill – Senate Bill 77 (Chapter 171, Statutes of 2007) (SB 77).

1. Proposition 1B

In November 2006, California voters approved Proposition 1B, which among other things, authorized $1 billion dollars to reduce emissions from goods movement in California's trade corridors.

> *"One billion dollars ($1,000,000,000) shall be made available, upon appropriation by the Legislature and subject to such conditions and criteria contained in a statute enacted by the Legislature, to the State Air Resources Board for emission reductions, not otherwise required by law or regulation, from activities related to the movement of freight along California's trade corridors. Funds made available by this paragraph are intended to supplement existing funds used to finance strategies and public benefit projects that reduce emissions and improve air quality in trade corridors commencing at the state's airports, seaports, and land ports of entry." (Government Code, Title 2, Division 1, Section 1, Chapter 12.49, Article 2, Section 8879.23(c)(2)).*

2. Senate Bill 88 and Assembly Bill 201

SB 88 and AB 201 set forth the implementing legislation for the Program in Health and Safety (H&S) Code, section (§) 39625 et seq. SB 88 broadly requires ARB to adopt Guidelines, establish funding criteria and procedures, and provide periodic reports.

Under SB 88, ARB must adopt Guidelines that include, at a minimum, all of the following:

- An application process for the funds, and any limits on administration costs.
- Requirements that local agencies identify the useful life of the project and project delivery milestones as part of the application process.
- Criteria for selection of local agency projects and equipment projects.
- Requirements for match funding.
- The method by which ARB will consider an air basin's status in achieving State and federal air quality standards.
- Requirements that grant agreements between ARB and local agencies identify project milestones and remedies for failure to meet project milestones.
- Accountability and auditing requirements, including provisions for audits of project expenditures and outcomes.

SB 88 and AB 201 detail more than 15 factors that ARB is directed to consider when allocating funds and selecting local agency projects. Some of these criteria are most effectively applied by targeting levels of funding to trade corridors and emission source categories, while others lend themselves to selecting among competing local agency projects or equipment projects. The steps ARB takes to allocate funds include:

- Identifying funding targets for the overall Program, plus setting funding priorities and defining the equipment project options for each appropriation.
- Competitively ranking and selecting local agency projects for funding in each appropriation cycle.
- Establishing the procedures that local agencies will use to competitively rank and select equipment projects for funding.

Tables I.1 - I.3 detail these steps and link each related provision of these Guidelines to the statutory requirements in the Health and Safety Code related to funding projects.

SB 88 also establishes basic reporting requirements for ARB and local agencies (all references are to the Health and Safety Code):

- ARB shall submit an annual report to the Legislature summarizing its activities related to the administration of this Program on January 10 [§39627.5].
- The local agency shall complete semi-annual reports on progress made toward implementation of the project [§39625.02(f)(1)].
- The local agency shall submit a final report on project completion within 6 months of the project becoming operable [§39625.02(f)(2)].

Table I.1 ARB Funding Priorities/Equipment Project Options and Statutory Funding Requirements

ARB Action *Guidelines reference*	**Provisions**	**Statutory Requirements** [references to Health and Safety Code]
1. Recommend trade corridor funding targets *(corridors in §39625.1(e))* *Chapter II.B.1.*	Population relative to other trade corridors	The combination of population and goods movement emissions: considers the public health risk associated with goods movement-related emissions and air toxics [§39626(a)(1)(D)] and the public health benefits of the emission reduction from funded projects [§39625.5(b)(2)(B)]; allocates funds in a manner that gives priority to funding for emission reduction projects that achieve the earliest possible reduction of health risk in communities with the highest health risks from goods movement facilities [§39625.5(b)(1)]; and reflects whether reductions from funded projects are likely to occur in locations with elevated emissions and exposure [§39625.5(b)(2)(K)].
	Percent of emissions from goods movement relative to other trade corridors	
	State Implementation Plan (SIP) needs relative to other trade corridors	Considers an air basin's status in maintaining and achieving State and federal ambient air quality standards [§39626(a)(1)(D)], and SIP requirements [§39625.5(b)(2)(E)] in evaluating what level of funding should be administered by local agencies in each trade corridor.
2. Recommend category funding targets *(categories in §39625.1(c))* *Chapter II.B.2.*	Emissions from each category	Considers the severity and magnitude of the source category's contribution to goods movement emissions [§39625.5(b)(2)(D)], including greenhouse gas emissions [§39625.5(b)(2)(F)].
	Health impact of category	Allocates funds in a manner that gives priority to emission reduction projects that achieve the earliest possible reduction of health risk in communities with the highest health risks from goods movement facilities [§39625.5(b)(1)].
	Funding category	Requires competition for funding between local agency projects in four funding categories that represent a single source category or combination of categories (i.e., heavy duty diesel trucks are combined with truck electrification infrastructure and shore power is combined with cargo equipment). Expends funds in a manner that reduces the health risk associated with freight movement along California's trade corridors [§39625(d)], maximizes the emission reduction benefits [§39625(e)], and provides incentives to control emission sources that contribute to increased health risk in the future [§39625(e)].

Table I.1 ARB Funding Priorities/Equipment Project Options and Statutory Funding Requirements (cont.)

ARB Action Guidelines reference	**Provisions**	**Statutory Requirements** [references to Health and Safety Code]
3. Recommend funding priorities for each appropriation *Chapters II.B.3., II.B.4., and II.B.5.*	Projects that can be quickly implemented: Year 1 Truck retrofits with diesel PM filters and Los Angeles/Inland Empire port truck replacements Year 2 and later Truck, locomotive, and ships at berth projects	Allocates funds in a manner that gives priority to projects that achieve the earliest possible reduction of health risk in communities with the highest health risks from goods movement facilities [§39625.5(b)(1)]. Retrofitting trucks with diesel PM filters is the fastest way to reduce health risk because those retrofits can be accomplished quickly. Communities around the Ports of Los Angeles and Long Beach, and along the drayage truck routes to intermodal railyards or distribution centers, have elevated emissions and exposure from these truck operations [§39625.5(b)(2)(K)]. Truck upgrade projects quickly reduce the health risk in communities near high truck-traffic freeways, warehouse/distribution centers, ports, and railyards [§39625.5(b)(1)]. Locomotive projects cut the elevated, excess cancer risks in neighborhoods near railyards, as identified in ARB's health risk assessments [§39625.5(b)(1)]. Ships at berth projects further reduce diesel pollution in port communities, and cut greenhouse gas emissions [§39625.5(b)(2)(F)].
4. List eligible equipment project options and project specifications for each appropriation *(project types identified in §39625.5(a)(2))* *Chapter II.C.1. and Appendices A-H.*	Equipment and/or emission level	Begins with list of projects eligible for funding [§39625.5(a)(2)]. List of equipment project options considers: the ability to reduce criteria and toxic emissions [§39625.5(b)(2)(I)], the magnitude of the emission reduction [§39625.5(b)(2)(A)], public health benefits of the emission reduction [§39625.5(b)(2)(B)], existing (and pending) regulatory requirements [§39625.5(b)(2)(E)], use of advanced emission reduction technologies [§39625.5(b)(2)(G)] where demonstrated and available, and reduction in greenhouse gas emissions [§39625.5(b)(2)(F)] via detailed specifications for equipment upgrades. For locomotives, establishes additional provisions for Class I railroads that have signed agreements with public agencies to allow ARB to ensure that the emission reductions from any locomotive projects for these railroads are not necessary to satisfy any mandated reduction requirement under any such agreement [§39625.5(a)(2)(B)]. Specifically prohibits funding for idle reduction devices required by the 2005 Memorandum of Understanding.
	Funding caps/match funding	Requires a specified contribution of funds leveraged from other sources or in-kind contributions to the project [§39626(a)(1)(B)], considers the cost-effectiveness of the reduction [§39625.5(b)(2)(C)] and helps leverage other funds [§39625.5(b)(2)(H)] via caps on State bond funds that can be requested for each equipment project option. State bond funding caps amount to roughly 1/3 to 1/2 of total project cost, with the remainder covered by private or public matching funds.

Table I.1 ARB Funding Priorities/Equipment Project Options and Statutory Funding Requirements (cont.)

ARB Action **Guidelines reference**	**Provisions**	**Statutory Requirements** [references to Health and Safety Code]
4. (cont.)	Project life	Considers sustainability of the emission reductions via minimum project life expressed as years of operation or activity levels for upgraded equipment [§39625.5(b)(2)(C)] and project life element of reductions over project lifetime per State dollar invested [§39625.5(b)(2)(J)].
	Project completion prior to regulatory requirement(s) or emission reductions beyond regulatory requirements	Considers the degree of surplus reductions [§39625.5(b)(2)(E)] and ensures funded projects achieve reductions not otherwise required by law or regulation [§39625.5(a)(1)] via requirements that equipment upgrades be operational a specified time period in advance of any regulatory requirement for such upgrade, or that upgrades achieve emission reductions greater than required by regulation.
	Conditions on future operations	Considers whether reductions are likely to occur in areas with elevated emissions and exposure [§39625.5(b)(2)(K)] via requirements for at least 90 percent California operation or home port, plus visitation frequency for trucks serving ports and intermodal railyards.

Table I.2 Selection Process for Local Agency Projects and Statutory Funding Requirements

ARB Action ***Guidelines reference***	**Based On**	**Statutory Requirements** [references to Health and Safety Code]
1. Issue notice of funding availability *Chapter II.E.1.*	Registration, application submittal and schedule, and requirement for community meeting	Starts local agency application process [§39626(b)]. Requires local agencies to share concepts for local agency projects, and solicit and consider community input prior to applying for Program funding – this helps ensure that local agency project proposals provide the earliest possible reduction of health risk in communities with the highest risk from goods movement [§39625.5(b)(1)].
2. Review local agency eligibility *Chapters II.E.2. and II.E.3.*	Basic qualification	Meets statutory definition of an applicant as a local public entity involved in freight movement or air quality improvements associated with goods movement [§39625.1(a)] and further requirements of these Guidelines.

Table I.2 Selection Process for Local Agency Projects and Statutory Funding Requirements (cont.)

ARB Action *Guidelines reference*	**Based On**	**Statutory Requirements** [references to Health and Safety Code]
3. Review local agency project eligibility *Chapter II.E.3.*	Completeness	Ensures presence of complete application and signed board/commission resolution needed to evaluate statutory requirements described below.
	Consistent with legal and project specifications	Ensures local agency project achieves emission reductions not otherwise required by law or regulation [§39625.5(a)(1)] and complies with all eligible equipment project options and equipment project specifications that encompass multiple statutory requirements (see above).
	Sponsored by an applicant and consistent with air quality plans	Local agency project is sponsored by an applicant as evidenced by project submittal [§39626.5(a)(1)] and project is consistent with any comprehensive local or regional plans or strategies to reduce emissions from goods movement [§39626.5(a)(2)].
	Availability of full funding	Requires project funding element to demonstrate that the funds are expected to be reasonably available and sufficient to complete the project [§39625.02(d)].
	Project schedule/milestones	Requires project applications to have project delivery milestones [§39625.02(e)(3)].
	Data for competitive ranking process	Requires project applications to reflect the useful life of the project specifications [§39625.02(e)(2)], as well as provide data on the emission reductions, total project cost, Program and match funds (other State, local, federal, and private) to support competitive ranking in Action 7 below.
4. Post eligible projects on Program website *Chapter II.E.3.*	Public access	Makes available preliminary list of projects being considered for funding for public input and comment [§39626(c)(1)].
5. Evaluate local agency capability to implement project scope *Chapter II.E.4.*	Resources to implement project scope within allowed time	Considers local agency's ability to implement equipment projects and emission reductions to achieve the earliest possible health risk reduction [§39625(e)] and [§39625.5(b)(1)].
6. Require match funding *Chapter II.E.5. and Appendices A-H.*	Identify sources of match funding	Ensures that State bond funds are supplemented and matched with funds from federal, local, and private sources to the maximum extent feasible [§39625.5(c) and §39625.5(b)(2)(H)].

Table I.2 Selection Process for Local Agency Projects and Statutory Funding Requirements (cont.)

ARB Action *Guidelines reference*	**Based On**	**Statutory Requirements** [references to Health and Safety Code]
7. Competitively rank local or State agency projects *Chapter II.E.6.*	Emission reductions score	Requires local agency projects to compete within a funding category based on greatest emission reductions [§39625.5(a)(1)] and magnitude of the emission reductions [§39625.5(b)(2)(A)]. Considers public health benefits of the reductions by weighting combustion PM (i.e., diesel PM) by a factor of 20 relative to criteria pollutant NOx to reflect the greater health impact of each ton of PM emissions [§39625.5(b)(2)(B)], sustainability of the reductions via project life [§39625.5(b)(2)(C)], and ability to reduce criteria and toxic pollutants by considering NOx and diesel PM [§39625.5(b)(2)(I)].
	Cost-effectiveness score	Considers cost-effectiveness of the emission reductions [§39625.5(b)(2)(C)] and ability to leverage funds from other sources [§39625.5(b)(2)(H)] by assessing total weighted emission reductions over project lifetime per State dollar invested [§39625.5(b)(2)(J)].
	Competitive ranking	Equally weights the above scores.
8. Hold workshops *Chapter II.E.7.*	Public input	Requires ARB staff to hold public workshops in northern, central, and southern California to discuss the preliminary list of local agency projects being considered for funding [§39626(c)(2)].
9. Recommend project funding *Chapter II.E.8.*	Local agency competitive ranking	Allocates funds on a competitive basis for projects that achieve the greatest emission reductions from each source category [§39625.5(a)(1)].
	Available funds and funding priorities	Limits selection or "programming" of local agency projects to funds appropriated by the Legislature [§39626(d)].
10. Hold hearing to adopt project list *Chapter II.E.9.*	Public hearing and Board adoption of funding awards to local or State agency projects	Requires consideration of projects at a regularly scheduled public hearing [§39626(c)(3)]. Requires adoption of a final list of projects for funding [§39626(c)(3)].
11. Execute local agency or interagency agreements *Chapters II.E.10. and II.E.11.*	ARB and local or State agency to sign	Implements grant funding via legal agreements between ARB and recipient local or State agencies [§39625.3]. Ensures statutory and Guideline requirements for local or State agency projects are met.

Table I.3 Selection Process for Equipment Projects and Statutory Funding Requirements

Local Agency Action *Guidelines reference*	**Based On**	**Statutory Requirements** [references to Health and Safety Code]
1. Solicit equipment project applications *Chapters IV.A.2., IV.A.3., and IV.A.4.*	Marketing/outreach and application elements including data for competitive ranking process	Requires project applications to reflect the useful life of the project [§39625.02(e)(2)], as well as provide data on the equipment activity to estimate emissions, total project cost, and Program and match funds (other State, local, federal, and private) to support competitive ranking in Action 3 below. Also requires local agencies to promote truck efficiency upgrades to reduce greenhouse gases [§39625.5(b)(2)(F)]. For truck electrification infrastructure projects, requires local agencies to encourage the participation of small businesses in the construction of the State's infrastructure [Government Code Section 14838.1].
2. Require match funding *Chapter IV.A.6. and Appendices A-H.*	Identify sources of match funding	Ensures that State bond funds are supplemented and matched with funds from federal, local, and private sources to the maximum extent feasible [§39625.5(c) and §39625.5(b)(2)(H)].
3. Competitively rank equipment projects (each engine, vehicle, or piece of equipment competes separately) *Chapter IV.A.7.*	Emission reductions score	Requires equipment projects to compete within a source category and trade corridor based on greatest emission reductions [§39625.5(a)(1)] and magnitude of the emission reductions [§39625.5(b)(2)(A)]. Also considers: public health benefits of the reductions by weighting combustion PM (i.e., diesel PM) by a factor of 20 relative to criteria pollutant NOx to reflect the greater health impact of each ton of PM emissions [§39625.5(b)(2)(B)], sustainability of the reductions via project life [§39625.5(b)(2)(C)], and ability to reduce criteria and toxic pollutants by considering NOx and diesel PM [§39625.5(b)(2)(I)].
	Cost-effectiveness score	Considers cost-effectiveness of the emission reductions [§39625.5(b)(2)(C)] and ability to leverage funds from other sources [§39625.5(b)(2)(H)] by assessing total weighted emission reductions over project lifetime per State dollar invested [§39625.5(b)(2)(J)].
	Competitive ranking	Equally weighting the above scores.
4. Post ranked projects *Chapters IV.A.1. and IV.A.7.*	Public access	Provides public access to competitively ranked projects proposed for funding prior to signature of contracts with equipment owners [consistent with statutory provision for ARB to do the same in §39626(c)(1)].
5. Execute equipment project contracts *Chapter IV.A.11.*	Local agency and equipment owner (and any lessee) to sign	Ensures statutory and Guideline requirements for equipment projects are met.

3. Legislation

Assembly Bill 892 (Furutani, Statutes of 2009) authorizes local agencies to award unspent or returned funds from previously obligated contracts to new equipment projects. Local agencies may either award these funds to new equipment projects selected from the same competitively ranked list as was used in the original award or return the funds to ARB for reallocation as described in the Guidelines. Local agencies must disburse any unspent or returned funds on a new contract within 4 years of the date of the award of the original contract or the funds revert to the California Ports Infrastructure, Security, and Air Quality Improvement Account Highway Safety, Traffic Reduction, Air Quality and Port Security Fund of 2006.

Assembly Bill 672 (Bass, Statutes of 2009) allows local agencies implementing approved Proposition 1B projects to apply to the administering State agency for a "letter of no prejudice" to authorize future reimbursement for funds to be advanced by the local agency at its own risk. Although the legislation is primarily directed at transportation projects funded by Proposition 1B, it also applies to air quality projects. Projects covered by a letter of no prejudice would not gain an advantage or higher priority for funding. The ARB Executive Officer or his or her designee has the authority to specify the submittal process and ARB staff approval procedures for letters of no prejudice.

4. Directives

In January 2007, Executive Order S-02-07 highlighted the importance of transparency and accountability in administering the over $40 billion in bond funding approved by California voters in 2006. The Executive Order directs all State government entities responsible for expending bond proceeds to establish and document a three-part accountability structure that includes:

- Front-end accountability, which defines the criteria for expending bond funds as well as the outcomes that the funds are intended to achieve.
- In-progress accountability, which documents actions to ensure projects are staying within scope and cost, and requires semi-annual reports to the Department of Finance (DOF).
- Follow-up accountability, which requires Program review or fiscal audits to ensure expenditures achieved the intended outcomes and were consistent with legal requirements.

ARB submitted and DOF approved the three-part structure for this Program (based on the initial Guidelines) in February 2008. The approved structure is available on the Program website.

SB 77 also:

- Called on ARB to move quickly—without sacrificing accountability—to provide relief for the individuals who reside along California's busy trade corridors.
- Directed ARB to ensure funding is allocated consistent with the accountability safeguards in the Executive Order.
- Charged ARB to develop Guidelines that make sense, reduce bureaucratic red tape, simplify and expedite project application and award procedures, and ensure projects are completed in record time.
- Called on local agencies to work closely with ARB to be prepared to submit applications for funding as soon as possible.

C. Definitions

The following definitions apply for the purposes of these Guidelines.

Table I.4 Definitions

Term	Definition
Administrative Agency	"Administrative agency" (henceforth ARB or Board) is defined by SB 88 to be the Air Resources Board as the State agency responsible for programming Program funds.
Administration Funds	"Administration funds" are defined as the monies up to the limits defined in these Guidelines to cover expenses incurred for implementation of the Program by ARB or a local agency that is party to an executed grant agreement.
Allocation	"Allocation" is defined as the Board action to award grant funds to local agencies as documented in a Board resolution.
Applicant	"Applicant" is defined by SB 88 to mean a "local public entity involved in the movement of freight through trade corridors of the state or involved in air quality improvements associated with goods movement." For the purpose of administering a loan or loan guarantee program only, an applicant may be any State agency, including ARB. These Guidelines clarify how ARB will assess a local public entity's eligibility as a Program applicant.
Appropriation	"Appropriation" means an authorization by the Legislature in the annual Budget Act to make funds available from the California Ports Infrastructure, Security, and Air Quality Improvement Account Highway Safety, Traffic Reduction, Air Quality and Port Security Fund of 2006 to ARB for the purpose of implementing this Program.
ARB or Board	"ARB" or "Board" means the California Air Resources Board. The term "Board" is specifically used to refer to the governing board of the agency and is typically associated with formal actions to adopt Guidelines or projects for funding.
Authorized Local Agency Representative	"Authorized local agency representative" means the individual(s) from the local agency authorized to sign or act on behalf of the local agency.

Table I.4 Definitions (cont.)

Term	Definition
California Coastal Waters	"California Coastal Waters" means that area between the California Coastline and a line starting at the California-Oregon border at the Pacific Ocean and ending at the California-Mexico border at the Pacific Ocean, with a western boundary about 25 miles off the coast at the narrowest to just over 100 miles at the widest. (See Appendix K for map with approximate miles and exact coordinates.)
California Registration	"California Registration" means vehicle base-plated registration documentation issued by the California Department of Motor Vehicles (DMV) including apportioned DMV registration issued under the International Registration Plan (IRP) only if California is selected as the base jurisdiction (California IRP).
Class 6 Truck	"Class 6 Truck" means a heavy duty truck with a Gross Vehicle Weight Rating of 19,501 to 26,000 pounds, equipped with a medium-heavy duty engine.
Class 7 Truck	"Class 7 Truck" means a heavy duty truck with a Gross Vehicle Weight Rating of 26,001 to 33,000 pounds, equipped with either a medium-heavy duty engine or a heavy-heavy duty engine.
Class 8 Truck	"Class 8 Truck" means a heavy duty truck with a Gross Vehicle Weight Rating of 33,001 pounds or greater, equipped with a heavy-heavy duty engine.
Contract	"Contract" means the legally binding agreement between a local agency and equipment owner. (Also referred to as an Equipment Project Contract.)
Contract Term	"Contract term" means the combined time period for: • Equipment project completion; and • The equipment project life. (Also referred to as "equipment project contract term.")
Cost-Effectiveness	"Cost-effectiveness" means the total pollutant-weighted emission reductions over the project life, per dollar of State funding invested, except for State funds specifically excluded from this calculation by the Guidelines.
Days	"Days" means calendar days, unless otherwise noted.
Diesel Particulate Matter (Diesel PM)	"Diesel particulate matter (diesel PM)" means the particles found in the exhaust of diesel engines, which may agglomerate and adsorb other species to form structures of complex physical and chemical properties. Diesel PM is a subset of fine particulate matter 2.5 microns or less in diameter (PM2.5).
Drayage Truck Rule	"Drayage Truck Rule" means the Drayage Truck Regulation (California Code of Regulations, Article 4.5, Division 3, Title 13, § 2027). Drayage trucks are defined in Section C.15 of the Drayage Truck Regulation.
Earned Interest	"Earned interest" means accrued interest from Program funds being held by the local agency in interest-bearing accounts.
Elapsed Equipment Project Life	"Elapsed equipment project life" means the time elapsed since post-inspection of the completed project by the local agency.
Equipment Project	"Equipment project" means an upgrade of existing diesel equipment via retrofit, repower, replacement, installation of electrical infrastructure, or an emissions capture and control system, according to Program requirements. Each individual truck, locomotive, railyard, piece of cargo equipment, harbor craft, ship berth, truck stop, or distribution center proposed for upgrade is considered a separate equipment project.

Table I.4 Definitions (cont.)

Term	Definition
Equipment Project Alternative	"Equipment project alternative" means one or more choices that the local agency may propose to customize the local agency project proposal in its application.
Equipment Project Completion	"Equipment project completion" means the date the local agency determines that all equipment project requirements are completed with the exception of ongoing maintenance, operation, and annual reporting requirements for the new or upgraded equipment. For each equipment project, this includes the liquidation of Program funds and successful post-inspection (including scrappage, if required).
Equipment Project Cost	"Equipment project cost" means the total cost of the equipment project, including State and non-State funding, but excluding administration funds.
Equipment Project Life	"Equipment project life" for each project option in these Guidelines means the length of time an equipment owner is obligated (under an equipment project contract) to maintain and operate the bond-funded equipment according to the requirements of the Program.
Equipment Project Option	"Equipment project option" means the specific mechanism to retrofit, repower, or replace a diesel engine, or provide an alternative power source to reduce emissions of diesel PM and/or NOx. A source category may include multiple equipment project options (e.g., truck retrofit, repower, and replacement are each distinct project options as defined in these Guidelines). (Also referred to as "project option.")
Expenditure	"Expenditure" means payment of Program funds. "ARB expenditure" means ARB's payment of Program funds to a local agency, another State agency, or a contractor; or use of those funds for internal administration. "Local agency expenditure" means a local agency's payment of Program funds to an equipment owner or a contractor; or use of those funds for internal administration.
Fleet size	"Fleet size" means the number of diesel-fuel vehicles traveling in California that are registered to be driven on public highways and have a manufacturer's gross vehicle weight rating of 14,001 pounds or greater that are under common ownership or control [as defined in CCR section 2025 in title 13, article 4.5, chapter 1] by a person, business, or government agency.
Freshly Manufactured Locomotive Engine	"Freshly manufactured locomotive engine" means, pursuant to Code of Federal Regulations Title 40, Part 92.2, a new locomotive engine which has not been remanufactured.

Table I.4 Definitions (cont.)

Term	Definition
Funding Category	"Funding category" means the source category or combination of source categories for purposes of establishing funding targets and competition between equipment projects. For example, the shore power and cargo equipment source categories are combined into a single funding category with a recommended funding target.
Goods	"Goods" are defined as having the same meaning in Commercial Code section 2105, which essentially requires that: • The goods must be movable; and • The goods being moved must be part of a transaction that involves a contract for the sale of the goods.
Guidelines	"Guidelines" means the *Proposition 1B: Goods Movement Emission Reduction Program – Guidelines for Implementation* and accompanying Final Staff Report adopted February 28, 2008, and any subsequent amendments to those Guidelines adopted by the Board or enacted via ARB Executive Order.
Grant	"Grant" means the Program funding allocated by ARB to a local agency under a grant agreement (or alternate mechanism for State agencies). (Also referred to as "grant funds" and "grant award.")
Grant Agreement	"Grant agreement" means the legally binding agreement between ARB and a local agency.
Grant Agreement Term	"Grant agreement term" means the time period identified in a local agency project grant agreement within which a local agency is legally bound to fully implement the local agency project.
Grant Expenditure Request	"Grant Expenditure Request" means the form used by the local agency to request Program funds from ARB.
Independent Owner Operator	"Independent owner operator" means a person who both owns a single heavy-duty diesel truck and personally operates that truck to haul goods.
Interagency Agreement	"Interagency agreement" means the legally binding agreement between ARB and a State agency.
Liquidation	"Liquidation" means the full expenditure of all Program funds in an executed grant agreement or equipment project contract. "ARB liquidation" means the full expenditure of all Program funds identified in an executed grant agreement. "Local agency liquidation" means the full expenditure of all Program funds identified in an executed equipment project contract.
Loan or Loan Guarantee Program - State agency	"Loan or loan guarantee program" means a program established by a State agency to assist equipment owners to obtain financing to retrofit or replace heavy-duty trucks.
Local Agency	"Local agency" means an eligible applicant or recipient of Program funds from ARB. For the purpose of administering a loan or loan guarantee program, a State agency may be considered a local agency. A local agency that is administering Program funds under an executed grant agreement is also referred to as a recipient agency in SB 88.
Local Agency Board/ Commission	"Local agency board/commission" means the popularly elected or appointed governing body of a local public entity.

Table I.4 Definitions (cont.)

Term	Definition
Local Agency Project	"Local agency project" means the funding category-specific incentive program that the local agency proposes to implement with Program funding.
Local Agency Project Implementation Approach	"Local agency project implementation approach" means the mechanism(s) a local agency may propose to implement one or more equipment project options. For example, as part of a single local agency project, a port may propose to employ three contractors to run truck replacement programs – one focused on a lease-to-own program for diesel trucks, one on leasing natural gas trucks, and one on offering grants to truck owners for purchase of new trucks. Each of these mechanisms are implementation approaches.
Local Public Entity	"Local public entity" means a county, city, district, public authority created by statute, public agency, and any other political subdivision in the State. Local public entities do not include states or the federal government.
Locomotive Remanufacture	"Locomotive remanufacture" means one or more of the following, pursuant to Code of Federal Regulations Title 40, Part 92.2(1): • To replace, or inspect and qualify, each and every power assembly of a locomotive or locomotive engine, whether during a single maintenance event or cumulatively within a five-year period; • To upgrade a locomotive or locomotive engine; • To convert a locomotive or locomotive engine to enable it to operate using a fuel other than it was originally manufactured to use; or • To install a remanufactured engine or a freshly manufactured engine into a previously used locomotive.
Locomotive Repower	"Locomotive repower" means, pursuant to Code of Federal Regulations Title 40, Part 92.2, replacement of the engine in a previously used locomotive with a freshly manufactured locomotive engine.
Match Funding	"Match funding" means the non-Program funds used in conjunction with Program funds to fully fund proposed local agency and equipment projects. These may include monies from private, local, other State, and federal sources, except as otherwise provided under these Guidelines or local, State, and federal law.
Middle-Aged Truck	For the purposes of a three-way truck transaction for projects receiving Year 1 through Year 3 funds, a "middle aged truck" means a truck with a MY1998-2006 engine. For the purposes of a three-way truck transaction for projects receiving Year 4 funds, a "middle aged truck" means a PM retrofitted truck with a MY1998-2006 engine.
Model Year (MY) 2007 Emissions	"MY2007 emissions" for trucks means emissions of 1.20 grams per brake horsepower-hour (g/bhp-hr) or less of NOx (FEL and CERT values), and 0.01 g/bhp-hr or less of PM (CERT value), as certified by the most recent ARB Executive Order for on-road use with an intended service of Heavy-Heavy Duty Diesel for diesel engines or Heavy Duty Otto for applicable alternative fuel vehicles.
Model Year (MY) 2007+ Emissions	"MY2007+ emissions" for trucks means emissions of 0.50 g/bhp-hr or less of NOx (FEL and CERT values), and 0.01 g/bhp-hr or less of PM (CERT value), as certified by the most recent ARB Executive Order for on-road use with an intended service of Heavy-Heavy Duty Diesel for diesel engines or Heavy Duty Otto for applicable alternative fuel vehicles.

Table I.4 Definitions (cont.)

Term	Definition
Model Year (MY) 2010 Emissions	"MY2010 emissions" for trucks means CERT and FEL emissions of 0.20 g/bhp-hr or less of NOx (FEL and CERT values), and 0.01 g/bhp-hr or less of PM (CERT value), certified by the most recent ARB Executive Order for on-road use with an intended service of Heavy-Heavy Duty Diesel for diesel engines or Heavy Duty Otto for applicable alternative fuel vehicles.
Non-performance	"Non-performance" means the act of not completing one or more components of an executed local agency project grant agreement or equipment project contract.
Not Otherwise Required by Law or Regulation	"Not otherwise required by law or regulation" means the emission reductions are not required pursuant to any local, State, or federal law, rule, or regulation; any requirements imposed by the California Environmental Quality Act (CEQA); or any requirements imposed by a legal instrument such as a legal settlement or consent decree (collectively referred to as "law or regulation"). For purposes of this Program only, "not otherwise required by law or regulation" does not apply to any tariff, ordinance, or other requirement imposed by a local agency based on that local agency's authority as a market participant or municipal proprietor or the local agency's authority to enter into contracts with equipment owners and operators.
Notice of Funding Availability	"Notice of Funding Availability (NOFA)" is defined by statute as ARB's public announcement to begin solicitation of local agency project applications.
Obligation	"ARB obligation" means the initial award of Program funds by the Board to specific local or State agency projects, followed by execution of a grant agreement between ARB and a local agency or an interagency agreement between ARB and another State agency. "Local agency obligation" means the execution of an equipment project contract between a local agency and equipment owner. "State agency obligation" means the commitment of specific Program funds for truck loan and guarantee programs. Board adoption of a resolution awarding funds via specific, named grant or interagency agreements to local or State agencies shall satisfy State requirements to encumber funds within 1 year of the date of appropriation. (Also referred to as "encumbrance.")
Old Truck	"Old truck" means a truck with a MY1993 or older engine for the purpose of the three-way truck transaction.
Program	"Program" means the Goods Movement Emission Reduction Program, except as otherwise noted.
Program Funds	"Program funds" means the combination of both project and administration funds.
Project Benefits Calculator	"Project Benefits Calculator" or "Calculator" means an analytical method and inputs provided by ARB to estimate the emission reductions and cost-effectiveness of proposed projects.
Project Funds	"Project funds" means the funds used directly to upgrade equipment – it does not include funds used by ARB, local agencies, or other State agencies for administration of the Program.
Recaptured Funds	"Recaptured funds" means Program funds newly eligible for distribution or redistribution prior to any statutory reversion requirements.

Table I.4 Definitions (cont.)

Term	Definition
Recipient Agency	"Recipient agency" means the local agency or State agency that receives Program funds under an executed grant agreement, interagency agreement, or other mechanism (for ARB).
Replacement	"Replacement" means the act of replacing higher-emitting diesel vehicle(s), a piece of diesel equipment, or diesel harbor craft with a lower-emitting vehicle, piece of equipment, or craft (e.g., replacement of one or two old trucks with a new one).
Repower	"Repower" means the act of replacing a higher-emitting diesel engine with a new or remanufactured, lower-emitting engine in the same vehicle, piece of equipment, or harbor craft.
Retrofit	"Retrofit" means the act of adding emission control technology or modifying an engine on an existing diesel vehicle, piece of diesel equipment, or diesel harbor craft. The project specifications may require that this technology be an ARB Verified Diesel Emission Control Strategy.
Salvage Vehicle	"Salvage Vehicle" means any vehicle currently or previously titled as salvage, junk, or the equivalent. Salvage vehicles were often wrecked or damaged, and the owner, insurance company, financial institution, or leasing company considered it too expensive to repair.
Source Category	"Source category" means a discrete category of emission sources specific to this Program. A source category may contain multiple equipment project options. Under this Program, source categories include: heavy duty diesel trucks, locomotives and railyards, ships at berth, cargo handling equipment, and commercial harbor craft. To establish funding targets and promote appropriate competition between projects, ARB may combine multiple source categories within a "funding category."
State Implementation Plan	"State Implementation Plan" or "SIP" means the air quality plan adopted by ARB and local air districts (as applicable) that demonstrates how each region will attain or maintain national ambient air quality standards, as required by the federal Clean Air Act section 110.
Statewide Truck and Bus Rule	"Statewide Truck and Bus Rule" means the Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and other Criteria Pollutants from In-Use On-road Diesel-Fueled Vehicles (California Code of Regulations, Article 4.5, Division 3, Title 13, § 2025), (Also referred to as "Truck and Bus Rule.")
Supplemental Procedures	"Supplemental Procedures" means the *Supplemental Procedures for Ships at Berth and Cargo Handling Equipment Projects* document available on the Program website http://www.arb.ca.gov/gmbond. The Supplemental Procedures define the responsibilities of ARB, local agencies, and equipment owners.
Three-Way Truck Transaction	"Three-way truck transaction" for projects receiving Year 1 through Year 3 funds means the act of replacing a middle-aged truck with a new truck; installing a retrofit on the middle-aged truck and using it to replace an old truck; and scrapping the old truck. "Three-way truck transaction" for projects receiving Year 4 or later funds means the act of replacing a PM retrofitted middle-aged truck with a new truck; using the middle-aged truck to replace an old truck; and scrapping the old truck.

Table I.4 Definitions (cont.)

Term	Definition
Trade Corridor	"Trade corridor" means any one of the four following regions in California: Bay Area, consisting of: San Francisco Bay Area Air Basin (CCR Title 17 §60101) Central Valley, consisting of: San Joaquin Valley Air Basin (CCR Title 17 §60107) Sacramento Metropolitan Federal Ozone Nonattainment Area (40 CFR Part 81 §81.305, p.23886-23887, Apr 30, 2004) Los Angeles/Inland Empire, consisting of: South Coast Air Basin (CCR Title 17 §60104) Port Hueneme in Ventura County San Diego/Border Region, consisting of: San Diego County (Government Code §23137) Imperial County (Government Code §23113)
Verified Diesel Emission Control Strategy	"Verified Diesel Emission Control Strategy" or "VDECS" 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. (Note: ARB has separate procedures to verify control devices for stationary sources.)
Year 1	"Year 1" means the State of California's fiscal year (FY) from July 1, 2007 to June 30, 2008. (Also referred to as "FY2007-08.")
Year 2	"Year 2" means the State of California's fiscal year (FY) from July 1, 2008 to June 30, 2009. (Also referred to as "FY2008-09.")
Year 3	"Year 3" means the State of California's fiscal year (FY) from July 1, 2011 to June 30, 2012. (Also referred to as "FY2011-12.")
Year 4	"Year 4" means the State of California's fiscal year (FY) from July 1, 2012 to June 30, 2013. (Also referred to as "FY2012-13.")
Zero-Emission	"Zero-emission" means an engine producing no emissions of pollutants (including carbon dioxide, carbon monoxide, hydrocarbons, oxides of nitrogen, and particulates) when stationary or operating.

II. ARB Program Administration

This chapter identifies the proposed requirements for ARB to administer the Program. State law requires that the Board hold public hearings, adopt Guidelines, and adopt a final list of local and State agency projects that will receive funding from each appropriation. ARB staff shall implement the Board's direction as defined in Board resolutions, the Guidelines, and the list of local agency projects to be funded.

ARB staff's duties to administer the Program shall include, but are not limited to: developing and updating Guidelines and project specifications; issuing the Notice of Funding Availability (NOFA); soliciting, reviewing, and recommending local and State agency projects for funding; executing and implementing grant agreements with local agencies and interagency agreements with other State agencies; auditing local and State agency projects; tracking and reporting on progress in expending funds and achieving performance milestones; developing and maintaining a public website on the Program; and conducting workshops and other forms of outreach to seek public input on Program design and implementation.

A. Program Guidelines

As required by State law, ARB developed and adopted the initial Guidelines and 2008 Staff Report in a public process at the February 28, 2008 Board meeting. The Guidelines shall include, at a minimum, all of the following:

- An application process for the funds, and any limits on administration costs.
- Requirements that local agencies identify the useful life of the project and project delivery milestones as part of the application process.
- Criteria for selection of local and State agency projects and equipment projects.
- Requirements for match funding.
- The method by which ARB will consider the air basin's status in achieving State and federal air quality standards.
- Requirements that grant agreements between ARB and local agencies, and interagency agreements with other State agencies, identify project milestones, and remedies for failure to meet project milestones.
- Accountability and auditing requirements, including provisions for Program review or fiscal audit of project expenditures and outcomes.

~~Following each appropriation of Program funds to~~ ARB staff shall develop, and the Board will consider adoption of, any appropriate updates to these Guidelines prior to issuing the NOFA for ~~that~~ a funding cycle. ARB staff shall evaluate the progress of the Program and any changes needed to improve its effectiveness, plus advances in technology and updated equipment costs that create a need to revise the list of equipment project options. ARB staff shall provide adequate opportunity for public input, including release of any proposed updates to these Guidelines for public review prior to Board consideration at a noticed public hearing.

These Guidelines are designed and intended to effectuate the provisions of SB 88, AB 201, and AB 892. However, in the event a provision of these Guidelines conflicts with these bills, or any other statute enacted to implement Proposition 1B, the relevant statutory provisions shall control.

1. ARB staff clarification of Program requirements

During Program implementation, specific issues may arise that require ARB staff to interpret or clarify these Guidelines. ARB staff clarifications will be made available at http://www.arb.ca.gov/gmbond to assist local agencies with Program implementation.

2. Provisions that do not apply to projects receiving ~~FY2007-08~~ Year 1 through Year 3 funds

ARB staff evaluated the 2008 and 2010 Guidelines, including project specifications, and developed updates. The changes in the updated ~~2010~~ 2013 Guidelines apply to projects receiving ~~FY2007-08~~ Year 1 through Year 3 funds, with the exception of the provisions listed in Table II.1.

Table II.1 Provisions that Do Not Apply to Projects Receiving ~~FY2007-08~~ Year 1 through Year 3 Funds

Provision *Guidelines reference*	Description
1. Equipment Project Specifications *Appendices A-~~H~~HF.*	Appendix ~~H~~HF shows applicable equipment project specifications for ~~FY2007-08~~ Year 1 funded projects. Appendix F and G show applicable equipment project specifications for Year 2 and Year 3 funded projects. The equipment project specifications shown in Appendices A-E apply only to projects receiving ~~FY2008-09~~ Year 4 and later funds.
2. New Compliance Check Option *Chapter IV.A.8.*	Except for engine label violations, ~~A~~a local agency may not allow applicants in a solicitation for ~~FY2007-08~~ Year 1 funds to correct pollution citations that were outstanding at the time of application to avoid disqualification. A local agency may allow all affected applicants in a solicitation for Year 2 or Year 3 funds the ability to retain eligibility by correcting violations and paying any fines, in a timely manner, prior to execution of an equipment project contract(s) between the local agency and equipment owner.
3. Project Alternatives for Local Agencies *Chapter III.C.*	Local agencies administering ~~FY2007-08~~ Year 1 funds shall implement the approved project alternatives described in their grant agreements, despite any changes to those alternatives in these Guidelines.
4. Equipment Project Contract Requirements *Chapter IV.A.11.*	Local agencies administering ~~FY2007-08~~ Year 1 through Year 3 funds are not required to amend equipment project contracts to include any additional provisions required in these Guidelines, except for ships at berth projects.

Table II.1 Provisions that Do Not Apply to Projects Receiving ~~FY2007-08~~ Year 1 through Year 3 Funds (cont.)

Provision *Guidelines reference*	Description
5. Local Agency Timelines for Obligation and Expenditure of Funds *Chapters II.F. and IV.B.*	~~FY2007-08~~Year 1 funds must be obligated and expended by local agencies according to the timelines defined in the applicable grant agreement, including any amendment(s). ~~FY2008-09~~ Year 2 and later funds shall be obligated and expended according to the schedules in these Guidelines.
6. Local Agency Administration Funds *Chapter II.F.2.a.*	Local agency administration funds for projects receiving ~~FY2007-08~~ Year 1 funds are set on the schedule and at the level defined in the grant agreement, and may not be accelerated or increased to higher levels based on these Guidelines.
7. State Agency Loan or Loan Guarantee Program *Chapter II.D.*	~~FY2007-08~~Year 1 and Year 2 funds may not be used for loan or loan guarantee programs.

B. Program Funding Targets and Priorities

The Board approved funding targets for each trade corridor and each source category or groups of categories (referred to as a funding category). These targets provide overall direction for the Program, and guide each trade corridor in the development of viable project proposals. Such targets can help ensure that all of the statutory criteria are effectively implemented in a straightforward and transparent manner. These targets do not commit the Board to specific allocations in future years and are not considered a programming of funds to specific local agency projects. Funding for local agency projects in each individual funding cycle is responsive to priorities established by the Board and may not be directly proportional to the targets. ARB staff shall recommend funding levels for local (and State) agency projects that are designed to reach the targets over the course of the entire $1 billion Program.

1. Trade corridor funding targets

While SB 88 does not explicitly require an allocation by trade corridor, it does direct ARB to identify a means to consider an air basin's attainment status for State and federal air quality standards and its health risk from goods movement. ARB staff believes this is most efficiently and effectively done by targeting funding to each trade corridor based on population, goods movement emissions, and federal attainment needs. These targets also ensure that California residents in each defined trade corridor see benefits from the Program. Finally, such targets facilitate a transparent and open discussion of the optimum funding splits to reduce the contribution of goods movement sources to each region's toughest air pollution challenges. The 2008 Staff Report describes the basis for the targets.

The funding targets for each trade corridor, including all State and local Program administration funds, are:

Dollars	Trade Corridor
• $550 million:	Los Angeles/Inland Empire trade corridor
• $250 million:	Central Valley trade corridor
• $140 million:	Bay Area trade corridor
• $ 60 million:	San Diego/Border trade corridor

Since this Program looks at the trade corridors as part of a single goods movement system for California, local agencies administering bond monies shall be required to fund projects based on the total emission reductions expected in the State (not just their local area). The majority of the travel or operation must be in one or more of the trade corridors. Regions like the San Joaquin Valley with high through-truck and rail traffic will benefit from projects administered by local agencies in other trade corridors.

The funding for trucks serving ports and intermodal railyards (allocated to the corridors where those facilities are located) ~~will be~~ was available for all California trucks focused on that service, regardless of their home base. Thus, cleanup funds allocated to the Bay Area for the Port of Oakland may ~~go~~ have gone to trucks carrying agricultural products to and from the Central Valley. Likewise, funds for the ports in the Los Angeles area may ~~go~~ have gone to trucks based in the San Diego/Border region.

2. Category funding targets

SB 88 recognizes the need for projects to compete against others in the same funding category, not against projects in other funding categories. To implement this approach, set portions of the funding are targeted to each funding category, which may include one or more source categories. Category funding targets support the reduction in local and regional health risk from goods movement as a primary consideration. The 2008 Staff Report describes the basis for the original targets, and the 2010 Staff Report describes the basis for the revisions.

The targets for each funding category, including all State and local Program administration funds, are:

Dollars	Funding Category
$700 million:	Heavy duty diesel trucks that haul goods, plus any truck ~~stop or distribution center~~ electrification infrastructure.
$100 million:	Diesel freight locomotives and railyards.
$160 million:	Cargo ships at berth, plus cargo handling equipment used at a port or intermodal railyard.
$ 40 million:	Commercial harbor craft.

The Board directed ARB staff to manage the funds to reserve up to $100 million of the combined truck monies to assist existing drayage truck owners to complete the second phase of upgrades to reduce NOx in advance of the 2014 requirement. These priority funds for drayage trucks ~~are~~ were in addition to the $125 million of ~~FY2007-08~~ Year 1 funds expended for this purpose and were made available to drayage truck owners in late 2011.

3. Priorities for ~~FY2007-08~~ Year 1 funds

The Board adopted these priorities for ~~FY2007-08~~ Year 1 funds:

- Eligible projects that can quickly begin implementation and deliver air quality results. This is consistent with statutory direction to give priority to projects that achieve the earliest possible reduction of health risk in heavily impacted communities. These could be communities with high risks due to nearby goods movement facilities or communities impacted by high regional pollution levels from goods movement emissions.
- Truck retrofit projects to add diesel particulate filters for immediate, broad scale, cost-effective risk reduction in many communities. Based on the implementation schedules in related truck regulations, we expect that these projects would only be eligible for ~~FY2007-08~~ Year 1 funding.
- Port truck replacement projects in the Los Angeles/Inland Empire corridor to continue supporting the Port of Los Angeles and the Port of Long Beach clean truck tariff programs. These ports are requiring that all drayage trucks serving the ports be replaced (with models meeting 2007 emission standards) between late 2008 and the end of 2011. This schedule means any financial assistance from the Program needs to come in the early years.

4. Priorities for ~~FY2008-09~~ Year 2 and ~~FY2009-10~~ Year 3 funds

~~ARB staff proposes that the Board adopt these priorities for FY2008-09 and FY2009-10 funds:~~ The Board adopted these priorities for Year 2 and Year 3 funds:

- Truck upgrade projects to quickly reduce the health risk in communities near high truck-traffic freeways, warehouse/distribution centers, ports, and railyards. These projects also provide significant reductions to help meet federal air quality standards for regional air pollutants, including PM2.5 and ozone. This is consistent with statutory direction to give priority to projects that achieve the earliest possible reduction of health risk in heavily impacted communities. To support cost-effective early compliance with ARB's truck rules, the truck funds need to be front-loaded.
- Locomotive projects to cut the elevated, excess cancer risks in neighborhoods near railyards, as identified in ARB's health risk assessments. The California State Implementation Plan relies on incentives and other mechanisms to accelerate the introduction of cleaner locomotives and/or engines to attain federal PM2.5 and ozone standards in the South Coast and San Joaquin Valley Air Basins.

- Ships at berth projects to further reduce diesel pollution in port-side communities and greenhouse gas emissions. To comply with the January 2014 requirements of ARB's rule, these multi-year projects to install electric infrastructure to provide shore-based power to ships at berth must begin soon. With incentives, some of these installations may be able to begin operation early and to achieve extra reductions each year through greater use.

5. Priorities for Year 4 and later funds

ARB staff proposes that the Board adopt these priorities for Year 4 and later funds:

- Truck replacement and repower projects for the remaining fleets that can still achieve early or extra emission reductions. These projects will continue to reduce the health risk in communities statewide, especially those near freeways, distribution centers, and border crossing. In addition, these projects represent a vital investment to help attain federal and State health-based air quality standards.
- Locomotive replacement and upgrade projects based on the cleanest engines and emission controls available. These projects will further reduce the health risks near railyards and assist in the attainment of federal PM2.5 and ozone air quality standards for the South Coast and San Joaquin Valley Air Basins.
- Zero-emission replacement, repower, and upgrade projects in the truck, ships at berth, harbor craft, and cargo handling source categories. These projects will reduce greenhouse gas emissions and encourage the transition to cleaner technologies. ARB has supported the ability of local agencies to supplement the Program funds with federal and local monies to make alternative fuel choices that may have lower greenhouse gas emissions more attractive.

C. Project Specifications and Emissions

1. Project specifications for each funding cycle

Appendices A-E detail the equipment project options, including upgrade specifications, funding caps, minimum project life, and key operating conditions for Year 4 funds. For reference purposes, ~~Appendix F~~ Appendices F-H provide~~s~~ the equipment project options and specifications that apply only to projects receiving ~~FY2007-08~~ Year 1 through Year 3 funds. Local agencies can choose to propose projects for any or all of the funding categories to best address the air pollution problem in that trade corridor. ~~For future appropriations and updates to these Guidelines,~~ ARB staff ~~shall also~~ continues to consider the funding demand for eligible equipment project options, technology advances and costs, regulatory actions, the need for equipment eligibility and project requirements, and other new information.

SB 88 identifies projects eligible for funding to include:

- The replacement, repower, or retrofit of heavy-duty diesel trucks.
  - The equipment project options for Program funds include all of these approaches for Year 1 through Year 3 funds; retrofits are no longer eligible for Year 4 and later funds due to compliance deadlines.
- The replacement, repower, or retrofit of diesel locomotive engines, with priority given to switcher locomotive engines.
  - The equipment project options ~~for FY2007-08 funds include replacement and repower approaches. The new options~~ include replacement, rebuild, repower, and retrofit approaches, as well as an emerging locomotive emissions capture and control system.
- The provision of on-shore electrical power for ocean freight carriers calling at the State's seaports to reduce the use of auxiliary and main engine ship power at berth.
  - The equipment project options for Program funds include this type of technology.
- Mobile or portable shoreside distributed power generation projects that eliminate the need to use the electricity grid.
  - The equipment project options for Program funds include this type of technology, as well as an emerging ship emissions capture and control system.
- The replacement, repower, or retrofit of harbor craft that operate at the State's seaports.
  - The equipment project options for Program funds include replacement and repower approaches. The new options also include replacement and retrofit with hybrid technology.
- The replacement, repower, or retrofit of cargo handling equipment that operates at the State's seaports and railyards.
  - ARB's adopted regulation for diesel cargo handling equipment operating at ports and intermodal railyards requires this equipment to be upgraded to emission levels achievable through replacement or (possibly) repower. To ensure that the eligible projects in this category meet the statutory requirement to reduce emissions not otherwise required by law or regulation, and are cost-effective, the equipment project options for ~~FY2007-08~~ Year 1 funds include only retrofit of energy storage systems for rubber-tired gantry cranes that already comply with the ARB rule. For Year 2 and later funds, ~~T~~the ~~new~~ options include the repower of rubber-tired gantry cranes with ~~an electric or~~ zero-emission power system, and replacement of certain yard trucks with ~~electric or~~ zero-emission yard models that will reduce emissions beyond the requirements of the regulation.
- Electrification infrastructure to reduce engine idling and use of internal combustion auxiliary power systems at truck stops, intermodal facilities, distribution centers, and other places where trucks congregate.
  - The equipment project options for Program funds include this technology.

~~Following each appropriation of Program funds to ARB,~~ ARB staff shall evaluate and recommend for Board adoption specifications for equipment project options eligible to compete for funding in ~~that~~ each updated cycle, as needed and consistent with the State's fiscal policies for bond-funded programs. These options must be able to cost-effectively reduce emissions and health risk with a high degree of certainty. ARB staff shall assess the list of emission reduction projects identified in SB 88 for technical feasibility, emission reduction potential, and cost. ARB staff shall also consider other effective technology that is verified, available, and can be widely deployed to reduce emissions quickly.

Certain types of projects or activities shall **not** be eligible for funding under the Program. Such ineligible projects or activities include, but are not limited to:

- Projects to design, acquire rights-of-way, perform environmental review, build, improve, or operate transportation infrastructure (like roads, bridges, or interchanges; railyards, tracks, or sidings; rail or highway tunnel widening; railroad crossing grade separations; ship channel dredging; etc.).
- Projects to design, acquire rights-of-way, perform environmental review, build, improve, or operate intermodal transfer or distribution centers (also called inland ports), except for truck electrification infrastructure to reduce engine idling and use of internal combustion auxiliary power systems at truck stops, intermodal facilities, distribution centers, and other places where trucks congregate.
- Scientific or technical research and development activities, including programs to perform emissions testing on new technology.
- Business plan development or implementation.
- Equipment, vehicles, or ship berths owned or leased by the federal government, including the military.
- Fuel or electricity purchases.
- Operation and maintenance costs.
- Legal costs.
- Permit fees or taxes.
- Any other projects that cannot meet all of the requirements of these Guidelines.

The timing and resource demands to get Program funds obligated effectively preclude case-by-case consideration of projects. If a local agency supports demonstration of a cost-effective technology or approach that is consistent with the statute, ARB staff shall evaluate that technology for possible inclusion in the defined equipment project options in the next update to these Guidelines.

2. Quantifying project benefits

a) Pollutants

SB 88 identifies specific pollutants that are targeted for emission reductions under the Program:

- Diesel PM, which ARB identified as a toxic air contaminant.
- NOx and sulfur oxides (SOx) that contribute to PM2.5 formed in the atmosphere.
- NOx and reactive organic gases (ROG) that form ozone in the atmosphere.

SB 88 also adds reductions in greenhouse gases as a criterion to consider in evaluating which projects to fund.

As part of simplifying the Program, the Guidelines require quantification of diesel PM and NOx emissions and the resulting reductions from bond-funded projects. These are the two most consistently important pollutants to reduce the health impacts from goods movement in all four trade corridors, and the most likely to differ between competing proposals within the same source category.

Of the targeted source categories, only ships are still significant sources of SOx emissions. Shore power projects to reduce ship emissions at berth will effectively cut this pollutant. It is not necessary to quantify the SOx emission reductions from each competing shore power project. Comparing the reductions in diesel PM and NOx emissions is an adequate basis to assess shore power project proposals relative to others in the same source category. Diesel engines emit ROG, but emission levels are typically less than 1/10 of the NOx emissions, therefore should also not be a determining factor in project selection.

ARB staff considered greenhouse gas emissions in recommending the source category funding targets, specifically the amount allotted for shore power and cargo equipment projects that reduce fuel consumption. Since projects are competing within funding categories, there is no need to quantify greenhouse gas reductions from individual projects to support the competitive process.

b) Project Benefits Calculators

ARB staff shall develop and make available on the Program website ~~at:~~ ~~http://www.arb.ca.gov/gmbond~~ a Project Benefits Calculator (Calculator) for each source category eligible for funding under these Guidelines. These Calculators shall provide the basis for local agencies to quantify the emission reductions and cost-effectiveness of proposed local agency projects. If a local agency identifies an eligible local agency project that cannot be quantified with the Calculator for that source category, the local agency should contact ARB staff for guidance. The Calculators shall also provide the basis for local agencies and equipment owners to quantify the emission reductions and cost-effectiveness of proposed equipment projects. Over time, ARB staff shall build the emission reductions and cost-effectiveness calculator functions into the Goods Movement Online Database.

D. Provision for Truck Loan or Loan Guarantee Programs

ARB may make funding available for loan or loan guarantee programs. For the purpose of administering a loan or loan guarantee program (loan project) only, an applicant may be any State agency, including ARB [H&S §39625.1(a)].

Funds for a loan project may be provided from bond proceeds or through recaptured funds. For any loan project, ARB or other State agency may administer the program directly or may use contractors, such as established non-profit organizations, commercial lenders, truck financing entities, community development banks, and small business assistance entities, to administer the program. Any use of an external contractor requires the State agency to comply with applicable State contracting requirements.

The intent of offering Program funds for loan projects is to provide financial assistance and expand financing opportunities for owners of smaller truck fleets who are experiencing difficulty in obtaining financing to upgrade or replace their vehicles with cleaner technology. Loan programs may include:

- Direct loans (Program funds are used to make a loan directly to the equipment owner).
- Loan guarantees (Program funds are used to create a loan loss reserve to guarantee a loan made by a lender).
- Loan or interest rate subsidies (Program funds are used to buy down the interest rate).
- Lease-to-own (Program funds are used to subsidize a leasing program where the lessee takes ownership of the vehicle at the end of the lease).

The California Pollution Control Financing Authority's (CPCFA) California Capital Access Program (CalCAP), a form of loan portfolio insurance, is an example of a loan guarantee program. ARB's Providing Loan Assistance for California Equipment (PLACE) is an example of a program that provides both loan and loan guarantee programs utilizing partnerships with a State agency and contractors.

State agencies may apply for Program funds for loan projects that may include one of the above-described options or a similar program for equipment owners to retrofit or replace trucks.

Because there are many options and ways to implement a loan project, ARB requires that any proposed loan project meet the following conditions:

- Use funds to upgrade or replace eligible diesel trucks according to the project specifications in Appendix A.
- Adhere to any financial terms and conditions established by ARB staff in the grant or interagency agreement, which may include interest rate, loan term, and minimum credit requirements.
- Funds used for direct loans or lease-to-own projects must be used to implement a sustainable project (repayments will be used to provide additional loans or leases).
- Funds used for loan guarantees must provide a minimum leverage established by ARB.

The ARB Executive Officer or his or her designee has the authority to approve the structure and conditions of any proposed loan project to provide increased assistance to independent owner-operators and smaller trucking fleets.

See Chapter V.A. for State agency project implementation requirements.

E. ARB Process to Award Funds to Local and State Agencies

1. Notice of funding availability

ARB staff shall issue a notice of funding availability (NOFA) no later than November 30th of each fiscal year in which funds are appropriated or reappropriated by the Legislature, unless ARB staff determines that the Guidelines should be updated for those funds or the cash is not yet available to ARB. For ~~FY2007-08~~ Year 1 funding, ARB shall issue the NOFA within 2 weeks of Board adoption of the Guidelines. For ~~FY2008-09 and FY2009-10~~ Year 2 and later funding, ARB shall issue the NOFA following Board adoption of ~~the~~ any needed update to the Guidelines and cash availability, consistent with State fiscal policy.

The NOFA shall include:

- Registration instructions for local public entities seeking Program funds, including concurrent submittal of a demonstration that the local public entity qualifies as an applicant for Program funds.
- Submittal instructions and schedule for local agency project applications.
- The requirement that each applicant hold at least one community meeting prior to the **submittal** of the local agency project application to ARB (see Chapter III.D.).

2. Qualification of applicants

The statute requires an applicant for Program funds to be both a local public entity and one that is involved in the movement of freight through trade corridors or involved in air quality improvements associated with goods movement. For the purpose of administering a loan or loan guarantee program only, an applicant may include any State of California agency. Local public entities do not include states or the federal government. A "local public entity" is defined to include a county, city, district, public authority created by statute, public agency, and any other political subdivision in the State.

The first step in the application process is for a local public entity to register with ARB through the process described in the NOFA. ARB staff shall verify the status of the local public entity and provide access to the electronic application form for each verified local public entity.

Concurrent with the registration, the local public entity will also provide its qualifications for eligibility as a Program applicant so that ARB staff can begin the initial review of this demonstration.

ARB staff shall assess each local public entity's qualifications to determine if that entity meets the requirements of the statute and the Guidelines for applicants. ARB staff may request that the local public entity provide additional documentation to support this assessment.

A local public entity that qualifies as a Program applicant may also be referred to as an applicant or a local agency.

3. Review of local and State agency applications

ARB staff shall complete an initial review of each local and State agency project application to verify that the proposed project is consistent with these Guidelines and is eligible to compete for funding.

ARB staff shall notify any local and State agency that does not meet all of the requirements of paragraphs (a)-(g) of this section within 20 business days of ARB receipt of the completed application package. Notification may occur via letter or email to the designated local or State agency contact, at ARB staff's discretion.

ARB staff shall evaluate any deficiencies and determine, at staff's discretion, whether to disqualify the application or pursue resolution of any deficiencies with the local or State agency.

ARB staff shall post a list of eligible local and State agency project applications on the Program website for public review no later than 30 days after local and State agency project applications are due to ARB.

a) Completeness

ARB staff shall review a local or State agency project application to determine whether all required information is included in the application. At a minimum, ARB staff shall verify that the application is complete and includes a copy of the local agency board/commission resolution.

b) Consistency with legal and equipment project specifications

ARB staff shall review the local or State agency project application and assess the agency's certification that the proposed project achieves emission reductions "not otherwise required by law or regulation." ARB staff shall also evaluate whether the proposed project conforms to the specifications for the desired funding category. Proposals that combine multiple funding categories or that would allow emissions, equipment, technology, or Program funding levels that are inconsistent with one or more equipment project options defined in these Guidelines are subject to disqualification.

In addition, for any local agency project to retrofit, repower, or replace locomotives operated by the Class I railroads, ARB shall evaluate whether the emission reductions that would be achieved by the locomotive equipment project are or are not necessary to satisfy any mandated emission reduction requirement under an agreement between a railroad company and a State or federal agency, or a local air district. ARB must find that the emission reductions are not necessary to determine that the local agency project is eligible to compete for funding [H&S §39625.5(a)(2)(B)].

c) Consistency with air quality plans for goods movement

ARB staff shall assess the local or State agency project application to determine if it meets the requirement for consistency with local and regional plans (or regional elements of statewide plans) to reduce emissions from goods movement.

d) Availability of full funding

ARB staff shall assess the local or State agency project application to determine if it clearly identifies the source(s) of any State and non-State matching funds, and demonstrates that these funds are reasonably available within the timeframes of the project schedule (except for funds from a private equipment owner).

e) Project schedule and milestones

ARB staff shall assess the local or State agency project application to determine if it identifies the required project milestones and includes a demonstration of the agency's ability to meet the timelines of these Guidelines for fund obligation and expenditure.

f) Data to determine air quality benefits and cost-effectiveness

ARB staff shall evaluate the local or State agency project application to verify that it includes sufficient data to support calculation of the emission reduction factor and cost-effectiveness factor for the proposed project.

g) Project implementation demonstration

ARB staff shall evaluate the local or State agency project application to determine if it effectively demonstrates that the agency is prepared to administer the proposed project consistent with the detailed provisions of Chapter IV. or Chapter V., respectively.

4. ARB evaluation of local or State agency capability to implement the project scope

ARB staff shall assess the local or State agency project application to determine if it affirmatively demonstrates that the local or State agency has or will have the necessary expertise and resources in place to meet the demands of the proposed project scope, within the timelines established by these Guidelines.

ARB staff shall examine the local or State agency's documented statistics or other basis for establishing the relationship between the number of pieces of equipment that can be upgraded in a given timeframe and the number of Program staff needed to accomplish those upgrade projects. ARB staff shall rely on the documentation provided by the local or State agency and ARB's experience with this Program, the Carl Moyer program, and other incentive programs to assess the adequacy of the proposed staff resources. If ARB staff determines that the local or State agency has demonstrated the ability to handle the project type, but only at a lesser scope or scale than proposed, staff may identify an alternative scope.

> *For example, a local agency may propose to replace 5,000 trucks, but only demonstrate the resources and ability to process 2,000 trucks within the timelines established in these Guidelines. ARB staff may disqualify the application or recommend that the project go forward to the competitive process with a scope of 2,000 truck replacements (at a pro-rated funding level).*

If ARB staff determines that only a lesser scope is feasible based on the local agency's demonstration, ARB staff shall notify the designated local agency representative in writing and move the project forward to the competitive process based on the benefits of the pro-rated proposal for the funding category. ARB staff shall assume local agency support for a pro-rated proposal based on the acknowledgement required on the application.

5. Match funding

SB 88 distinguishes between State funds and monies from all other non-State sources. It also directs ARB to maximize the amount of match funds used to supplement Program funds. The ~~match~~ funds required to cover the difference between the Program funding cap and the total project cost can come from the private sector, local agencies, other State monies, or the federal government. Private match funding can be provided by the equipment owner, an industry sponsored program, or other sources.

See Chapter IV.A.6. for information on match funding for equipment projects from State funds and monies.

6. Competitive ranking of local or State agency projects

ARB staff shall use a quantitative approach to develop a prioritized list of eligible local and State agency projects. This process will be applied to competing local agency projects **within each trade corridor and funding category**. ARB staff shall publish the list of competitively ranked local agency projects on the Program website, as well as the list of eligible State agency projects for truck loans.

The competitive ranking shall be quantitatively based on multiple factors – emission reductions and a measure of cost-effectiveness that considers match funding. The calculation of emission reductions uses the Carl Moyer program protocol of weighting combustion PM emissions (essentially diesel PM) by a factor of 20 relative to other pollutants to account for the greater health impacts of PM per ton of emissions. This protocol helps target Program funding to the local agency projects that will achieve the greatest reduction in health risk.

a) Emission reduction score

Weighted emission reductions = Reduction in NOx + (combustion PM x 20) emissions in California over the average project life in pounds

ARB staff shall list local agency projects in descending order of emission reductions, with the greatest emission reductions on top and the lowest emission reductions on the bottom. ARB staff shall number or score each project starting at the bottom with a score of 1 and continuing consecutively to the top project. For example, if there are 8 project proposals, the one with the greatest emission reductions would receive a score of 8. See Figure II.1 for an example.

Emission Reductions Score = number from above evaluation

b) Cost-effectiveness and match score

For each proposed project in a funding category, ARB staff shall review the local agency's estimate of the total pollutant-weighted emission reductions, divided by the total State funding proposed for the project, based on the Calculator for that source category. Total State funding includes requested Program funds (project and administration funds), plus any other applicable State dollars (see Chapter IV.A.6.).

Cost-effectiveness = weighted emission reductions (lbs)/total applicable State $

ARB staff shall list local agency projects in descending order of emission reductions per State dollar, with the highest number on top and the lowest number on the bottom. ARB staff shall number or score each project starting at the bottom with a score of 1 and continuing consecutively to the top project. For example, with 8 project proposals, the one with the greatest emission reductions per State dollar would receive a score of 8. See Figure II.1 for an example.

Cost-Effectiveness Score = number from above evaluation

This calculation of cost-effectiveness indirectly accounts for the level of match funding. A project will always have a combination of Program funding and match funding (from State or non-State sources) to cover the total cost of the project. The cost-effectiveness equation uses the full weighted emission reductions achieved by the total project funding, not just a subset of the reductions in proportion to the State funding component. By counting the total weighted emission reductions, the Program recognizes the benefits of non-State match funds and offers a competitive advantage to local agency projects with greater match.

Figure II.1 Local agencies A,B,C submit competing truck projects (hypothetical)

Results from Project Benefits Calculator:

Agency/ Project	Reductions over 8-Year Project Life		Weighted Emission Reductions (tons)	State Dollars
	NOx tons	PM tons		
A/ Replace 1,000 trucks	3,170	220	7,570	$50M at $50k/truck
B/ Replace 800 trucks	2,536	176	6,056	$24M at $30k/truck
C/ Replace 700 trucks	2,219	154	5,299	$28M at $40k/truck

Emission Reduction Score

A-7,570 tons Score: 3
B-6,056 tons Score: 2
C-5,299 tons Score: 1

Cost-Effectiveness Score

B-0.5 lbs/$ Score: 3
C-0.4 lbs/$ Score: 2
A-0.3 lbs/$ Score: 1

Competitive Ranking	
Project B: 2+3	5 points
Project A: 3+1	4 points
Project C: 1+2	3 points

For example, assume the Program offers funding for up to 50 percent of the cost of new equipment, with the other 50 percent covered by non-State match funds (resulting in a 1:1 match). Most project proponents seek the maximum Program funds, but proponent X only requests Program funding for 25 percent of the total cost, with the other 75 percent covered by non-State match funds (effectively providing a 3:1 match). The emission reductions for all the projects would likely be similar, but the total reductions per State dollar are much greater for proponent X because this project relies on less State funds and more match funds.

c) Competitive ranking

ARB staff shall add the Emission Reductions Score to the Cost-Effectiveness Score to determine the final points for each local agency project. ARB staff shall rank local agency projects within each trade corridor and funding category from highest points to lowest points. See Figure II.1 for an example.

ARB staff shall assess the costs and benefits of any State agency proposals for truck loan projects, and rank those projects against each other, if appropriate.

7. Public workshops on eligible local and State agency projects

ARB staff shall hold no less than three public workshops statewide to discuss the competitively ranked list of eligible local and State agency projects and any preliminary ARB staff recommendations for funding projects. At least one workshop each will be held in northern California, the Central Valley, and southern California. At ARB staff's discretion, these workshops may be conducted between release of the competitive ranking and development of funding recommendations or after development of ARB staff funding recommendations. For ~~FY2007-08~~Year 1 funds, these workshops were not required by statute [H&S §39626(c)(2)].

8. Recommendations for funding local and State agency projects

Based on the competitively ranked list of eligible local agency projects and public input, ARB staff shall use a qualitative approach to develop recommendations on the level of funding for the top project(s) in each trade corridor and funding category. This approach shall consider the availability of Program funds, the trade corridor and category funding targets, and priorities established by the Board for each funding cycle. ARB staff shall also consider project proposals from any State agency for truck loan or loan guarantee programs.

ARB staff shall make these funding recommendations for local and State agency projects available to the public via the Program website prior to the public hearing conducted by the Board.

ARB staff shall follow this process:

a) Consideration of available funds and funding priorities

Starting with the project with the highest competitive ranking, ARB staff shall compare the requested Program dollars with the available funds, the Program funding targets for the trade corridor and funding category, and any priorities identified by the Board for those funds.

b) Funding level for project proposals

ARB staff shall recommend whether the most competitive local agency project in each trade corridor and funding category should be funded in whole, in part, or not at all in that funding cycle. ARB staff may recommend pro-rating the requested Program funding and the estimated performance measures (pieces of equipment, emission reductions, etc.) based on the available dollars and funding priorities.

Once the recommended funding is determined for the top project, ARB staff shall evaluate the project with the second highest competitive ranking in consideration of available funds and funding priorities. ARB staff shall continue until the appropriate level of funding for that trade corridor and category – in that funding cycle – is reached.

Based on the process described above for evaluating and ranking eligible local agency projects, as well as assessing the funding level, ARB staff shall issue its written recommendations to the Board for local agency project funding with the available grant funds, as well as any funding to State agencies for truck loan and loan guarantee programs.

9. Public hearing and Board action

The Board will hold a noticed public hearing to consider public testimony, written comments, and ARB staff recommendations for funding local agency projects and loan and loan guarantee programs with the available Program monies. At that hearing, the Board may adopt a resolution approving a final list of primary local agency projects, loan projects, and corresponding funding amounts for each project. This project list may identify ARB as an administering State agency for a loan project and the funds allocated for that purpose. This Board resolution initially obligates the funds, and provides ARB staff with the authority to enter into grant agreements or interagency agreements with the selected agencies, when bond funds are available [H&S §39626(c)(3)]. The ARB Executive Officer or his or her designee may delegate in writing the ability to sign agreements to another individual or individuals on ARB's executive management team.

The project list approved by the Board may also identify "backup" proposals (additional local or State agency projects or increases in funding levels for the approved projects). These backup proposals may be awarded funding if agreements cannot be executed for one or more of the primary projects within the timeframe specified by the Board in the resolution, a local or State agency is unable to expend all of the Program funds or fulfill its obligations, ~~or~~ a local or State agency requests to terminate or transfer its grant, or other funding becomes available.

10. Local agency grant agreement

The Board's funding decisions shall become legally enforceable through executed grant agreements between ARB and the selected local agencies. Each local agency project requires a separate local agency grant agreement.

ARB staff shall prepare and submit for review and signature two copies of the local agency grant agreement to each local agency approved for bond funding. The copies may be signed by ARB and then sent to the local agency for signature by an authorized representative from the local agency that will retain one fully executed copy for its files, and return one fully executed copy to ARB staff. Or ARB may send two copies to the local agency for signature by an authorized representative who will return both copies to ARB. ARB staff shall sign and return to the local agency one fully executed copy of the grant agreement for its files.

Each grant agreement with a local agency shall include, but is not limited to, the following elements.

a) Standard grant agreement provisions

- Grant agreement number—unique tracking number provided by ARB.
- Effective date.
- Term of grant agreement.
- Local agency contact information.
- Indemnification—local agency agrees to indemnify and hold harmless the State for any liability arising out of the performance by the local agency.
- Severability—remaining provisions of an agreement continue in effect even if a court holds a specific provision invalid.
- Force majeure—ARB and local agency are not liable for any delay or failure in performance resulting from war, natural disasters, and other acts beyond their control.
- Grant agreement amendments—amendments shall only occur by mutual agreement in writing and signed by all parties.
- Environmental justice—local agency agrees to conduct its programs in a manner that ensures the fair treatment of all people in the State.
- ARB's obligations to pay any funds are contingent upon the availability of funds. In the event funds are not available, the State shall have no liability to pay any funds to the local agency or to furnish any other considerations.

b) General Program provisions

- Application—incorporate by reference the original local agency application and board/commission resolution.
- Guidelines—local agency agrees to implement project in conformance with all applicable requirements of these Guidelines.
- Reporting requirements—local agency is responsible for submitting to ARB quarterly data updates, semi-annual reports, and local agency project completion reports, when requested by ARB staff.
- Ongoing evaluations, ~~and~~ Program reviews, and fiscal audits—local agency agrees to allow ongoing evaluations, Program reviews, and fiscal audits by ARB, other State agencies, or their designated representative(s).

- Records access requirements—local agency agrees to allow ARB or its designated representative(s) access to evaluate or audit Program records.
- Recordkeeping requirements—local agency agrees to retain Program records, e.g., invoices, contracts, and correspondence, for 35 years after the bond issuance date providing the funds for the grant or to send all records to ARB by the end date of the grant agreement in an electronic format to be determined by ARB. Program records for ineligible, withdrawn, or incomplete applications shall be retained by the local agency for at least 3 years from the time the application was received.
- Enforcement—provisions authorizing ARB or its designee to inspect equipment projects.
- Non-performance includes, but is not limited to:
    - Failure to comply with these Guidelines or statutes.
    - Failure to obligate or expend Program funds within established timelines, or to show timely interim progress to meet these timelines.
    - Insufficient performance or widespread deficiencies with Program oversight, enforcement, record keeping, contracting provisions, inspections, audit procedures or any other Program element as determined by ARB.
    - Misuse of Program funds.
    - Funding of ineligible equipment projects or other items.
    - Exceeding administration fund allotment.
    - Insufficient, incomplete, or faulty project documentation.
    - Failure to provide required documentation or reports requested from ARB, Department of Finance (DOF), or other agencies in a timely manner.
    - Poor performance as determined by ~~a~~ Program review or fiscal audit conducted by ARB, DOF, or other designee.
- Remedies for non-performance include:
    - Probation.
    - Recovery of funds.
    - Constraints on opportunity to compete for future Program funds.
- Direct payments to vendor—requirement for local agency to offer payments directly to vehicle or equipment dealers, ~~or~~ manufacturers, or financing entities if requested by equipment owner and local agency has the authority to issue these types of payments.
- Tax implications—local agency agrees to notify equipment owners of possible tax implications from receipt of Program funds and encourage participants to consult a tax professional.
- Program acknowledgment—local agency agrees to acknowledge the Program as a funding source in any related media events or other publicity material.
- Earned interest—local agency agrees to maintain records and report on interest earned on Program funds in local agency accounts, and to expend earned interest according to the provisions in these Guidelines.
- Recapture—ability of ARB to recapture Program funds.

c) Funding category-specific elements

- Local agency project description.
- Estimated total cost for project.
- Eligible costs—costs directly tied to the purchase and installation of upgraded equipment or other eligible equipment project costs as defined in the Guidelines or accompanying Staff Report.
- Ineligible costs—any cost specifically identified as ineligible in the Guidelines or accompanying Staff Report cannot be paid for or reimbursed with Program funds.
- Funding caps for each equipment project.
- Total grant amount.
- Total amount of estimated non-State match funds and source of funds.
- Project performance benchmarks—expected number of vehicles, pieces of equipment, berths, etc., to be upgraded and expected emission reductions.
- Project schedule—timeframe for completing the local agency project including major milestones and any milestones specific to each equipment project option.
- Expenditure schedule—estimated schedule for ARB to expend funds to the local agency.
- Request for payment—steps for a local agency to request expenditure of Program funds.
- Equipment project inspections—local agency agrees to complete equipment project pre-inspections ~~prior to execution of an equipment project contract (or following contract execution but prior to placement of purchase order at the local agency's option)~~ and post-inspections prior to reimbursement (except in the case of ~~direct payment to vendor~~ early reimbursement for ships at berth grid-based power projects).
- Equipment project contracts—local agency agrees to include all equipment project requirements and conditions (e.g., restrictions on operating location, provisions for electronic monitoring devices, etc.) in contracts with equipment owners.
- Proper disposal of old equipment—local agency agrees to establish agreements with qualified salvage yards and verify scrappage/disposal of old vehicle, vessel, equipment, or engine, and to comply with any ARB direction to make trucks available for reuse.
- Small businesses—outreach to small businesses for infrastructure construction.

11. State agency loan and loan guarantee program interagency agreement

The Board's funding decisions shall become legally enforceable through executed interagency agreements between ARB staff and the selected State agencies, unless ARB is the selected State agency. Each State agency project requires a separate interagency agreement.

ARB, if required, will enter into an interagency agreement with a State agency to implement a loan or loan guarantee program (loan project). ARB staff shall obtain all authorized State signatures and return to the other State agency one fully executed copy of the interagency agreement for its files. An interagency agreement is not required if ARB is the applicant and recipient of the Program funds.

The interagency agreement includes, but is not limited to, the following elements:

a) Standard interagency agreement provisions

- Interagency agreement number—unique tracking number provided by ARB.
- Effective date.
- Term of agreement.
- State agency contact information.
- Agreement amendments—amendments shall only occur by mutual agreement in writing and signed by all parties.
- Enforcement—provisions authorizing ARB or its designee to inspect equipment projects.
- Program acknowledgment—State agency agrees to acknowledge the Program as a funding source in any related media events or other publicity material.
- Non-performance includes, but is not limited to:
    - Failure to comply with these Guidelines or statutes.
    - Failure to obligate or expend Program funds within established timelines, or to show timely interim progress to meet these timelines.
    - Insufficient performance or widespread deficiencies with Program oversight, enforcement, record keeping, contracting provisions, inspections, audit procedures or any other Program element as determined by ARB.
    - Misuse of Program funds.
    - Funding of ineligible projects or other items.
    - Exceeding administration fund allotment.
    - Insufficient, incomplete, or faulty project documentation.
    - Failure to provide required documentation or reports requested from ARB, DOF, or other agencies in a timely manner.
    - Poor performance as determined by ~~an~~ Program review or fiscal audit conducted by ARB, DOF, or other designee.
- Remedies for non-performance include:
    - Recovery of funds.
    - Constraints on opportunity to compete for future Program funds.
- Earned Interest—State agency agrees to maintain records and report on interest earned on Program funds and to expend earned interest according to the provisions in these Guidelines.
- Reporting requirements—State agency is responsible for submitting semi-annual reports and project completion reports.
- Ongoing evaluations, Program reviews, and fiscal audits—State agency agrees to allow ongoing evaluations, Program reviews, and fiscal audits by ARB, other State agencies, or their designated representative(s).

- Records access requirements—State agency agrees to allow ARB or its designated representative(s) access to evaluate or audit records.
- Recordkeeping requirements—State agency agrees to retain Program records for 35 years after the bond issuance date for funds provided for the loan or loan guarantee program(s) or send all records to ARB within 2 years of the last loan being paid off in an electronic format to be determined by ARB.
- ARB's obligations to pay any funds are contingent upon the availability of funds. In the event funds are not available, the State shall have no liability to pay any funds to the State agency or to furnish any other considerations.

b) Scope of work provisions

- State agency project description.
- Project performance benchmarks—expected number of vehicles to be upgraded and expected emission reductions.
- Project schedule—timeframe for completing the State agency project including major milestones.
- Request for payment—steps for a State agency to request expenditure of Program funds.
- The amount of Program funds awarded to the loan project.
- Requirements for transferring funds between ARB and another State agency.

If ARB is the administering agency for a loan project and ARB contracts with either another State agency or other entity, ARB will require an interagency agreement or contract that includes the above provisions.

F. ARB Program Oversight

ARB is the administering agency for this Program, and is responsible for ensuring that Program funds are spent on equipment projects that meet the provisions of State Law and these Guidelines.

To maintain sound fiscal practices and ensure that projects can reach completion once begun, ARB staff shall provide a Start Letter (or multiple letters) for each grant. The Start Letter shall authorize the local agency (or State agency for loan projects) to proceed with project implementation based on a specified level of available funds. For a high dollar value grant, ARB staff may identify partial funding that conforms to the bond cash on deposit. The Start Letter shall itemize both the level of project funds and administration funds that are available at the request of the local agency, consistent with the performance benchmarks in the Guidelines and agreement. ARB may issue multiple Start Letters that authorize the local agency (or State agency for loan projects) to request additional funds, consistent with the grant or interagency agreement.

1. ARB obligations to local or State agencies

ARB shall obligate Program funds for each fiscal year's appropriation according to the obligation deadlines set forth in State law, but consistent with the State's fiscal policies for bond-funded programs. This is a two-step process, beginning with the Board's allocation of funds via resolution to specific local or State agency projects and ending with fully executed grant agreements or interagency agreements.

If needed, ARB staff may propose updates to the Guidelines for Board consideration prior to obligating funds from new appropriations.

2. ARB expenditures

ARB shall liquidate Program funds for each fiscal year's appropriation according to the liquidation deadlines set forth in State law but consistent with the State's fiscal policies for bond-funded programs.

- Once Program funds are obligated, with the exception of recaptured funds, any funds unspent by a local or State agency within the statutory timeframes revert back to the California Ports Infrastructure, Security, and Air Quality Improvement Account, and must be re-appropriated by the Legislature. It is therefore the policy of ARB to retain grant funds until necessary for the purchase of equipment, for the purpose of advancing the completion of an equipment project, for the purpose of funding a truck loan or loan guarantee program, or for the purpose of meeting liquidation deadlines set forth in State law.
- ARB shall only expend Program funds upon receipt of a valid Grant Expenditure Request submitted to ARB by an authorized local or State agency representative acting under a fully executed agreement.

a) Administration funds

Administration funds expended by ARB for this Program may be used by a local agency for the administration of a local agency project covered by a fully executed grant agreement. If a local agency has more than one fully executed grant agreement with ARB, administration funds identified under one grant agreement may be used to assist in the implementation of another grant agreement. Any project funds transferred by a local agency from one grant agreement to another, as approved by ARB, shall include the applicable amount of administration funds from that grant. The local agency shall not use administration funds in excess of the total administration funds allowed under all grant agreements (i.e., the sum of all administration funds for one local agency shall not exceed 5 percent of the total project funds awarded to that local agency).

Local agency requests for administration funds are subject to the following restrictions:

- Local agencies with the ability to generate new funding from goods movement sources to cover administration funds (e.g., seaports) shall be prohibited from requesting administration Program funds.
- In all other cases, requests for administration funds are capped as follows:
  - 3 percent of the grant amount for locomotives and railyards, cargo equipment, and ships at berth.
  - 4 percent of the grant amount for harbor craft.
  - 5 percent of the grant amount for trucks and truck ~~stop/distribution center~~ electrification infrastructure.

Administration funds expended by ARB for this Program may be used by a State agency for the administration of a State agency truck loan project covered by a fully executed interagency agreement, if applicable. State agency requests for administration funds are capped at 5 percent of the project funding awarded to the State agency for truck loans and loan guarantees.

Administration funds shall be used for tasks associated with Program outreach/marketing, implementation, and audit and oversight, including: staff time; consultant fees; printing, mailing, and travel costs; project monitoring and compliance expenses; and indirect Program costs, such as general administration services, office space, and telephone services.

(1) Initial expenditure

Consistent with the Start Letter, the local agency may request and ARB may initially expend administration funds for local agencies, according to the provisions for each source category listed in Table II.2 below, except for loan projects administered by a State agency. A State agency may request and ARB may approve administration funds up to 100 percent, consistent with the terms of the executed interagency agreement. The interagency agreement will include specific terms and conditions that the State agency must meet to request funds.

Table II.2 Initial Expenditure for Local Agency Administration Funds

Source Category	% of Funds	Requirements
Heavy duty diesel trucks	up to 90%	1. ARB and local agency have fully executed the grant agreement. 2. A Start Letter authorizes the expenditure based on available bond cash.
Locomotives and railyards	up to 50%	
Ships at berth	up to ~~25~~50%	
Cargo handling equipment	up to 50%	
Harbor craft	up to 50%	

(2) Additional expenditures

Consistent with the initial Start Letter or a subsequent Start Letter, the local agency may request and ARB may expend the remaining administration funds according to the provisions for each source category listed in Table II.3 below.

Table II.3 Additional Expenditures for Local Agency Administration Funds

Source Category	% of Funds	Requirements
Heavy duty diesel trucks	remaining	1. A Start Letter authorizes the expenditure based on available bond cash. 2. The local agency liquidates at least 50% of the total project funds and ARB staff verifies that this condition has been satisfied.
Locomotives and railyards	remaining	1. A Start Letter authorizes the expenditure based on available bond cash. 2. The local agency liquidates ~~at least~~ 100% of the total project funds and ARB staff verifies that this condition has been satisfied.
Ships at berth	remaining	
Cargo handling equipment	remaining	
Harbor craft	remaining	1. A Start Letter authorizes the expenditure based on available bond cash. 2. The local agency liquidates at least 50% of the total project funds and ARB staff verifies that this condition has been satisfied.

b) Equipment project funds

(1) Initial expenditure

Consistent with the Start Letter, the local agency may request and ARB may initially expend Program funds for equipment projects according to the provisions for each source category listed in Table II.4 below, except for loan projects administered by a State agency. Consistent with the Start Letter, a State agency may request and ARB may expend Program funds for loan projects up to 100 percent once the interagency agreement has been executed, if applicable.

Table II.4 Initial Expenditure for Local Agency Equipment Project Funds

Source Category	% of Funds	Requirements
Heavy duty diesel trucks	up to 100%	1. A Start Letter authorizes the expenditure based on available bond cash. 2. The local agency has provided data on eligible equipment projects to ARB. ARB staff has approved the competitively ranked list of projects. The local agency has posted the approved list on its public website. 3. The approved list demonstrates a demand for the requested project funding. ~~ARB staff has determined that the local agency's equipment project contract template, and any lease-to-own programs for trucks, meet the requirements of the Guidelines.~~
Locomotives and railyards	up to 10%	
Ships at berth	up to 80~~10~~%	
Cargo handling equipment	up to 100%	
Harbor craft	up to 10%	

(2) Additional expenditures

Consistent with the initial Start Letter or a subsequent Start Letter, the local agency may request and ARB may expend the remaining Program funds for equipment projects according to the provisions for each source category listed in Table II.5 below.

Table II.5 Additional Expenditures for Local Agency Equipment Project Funds

Source Category	% of Funds	Requirements
Heavy duty diesel trucks	remaining	1. A Start Letter authorizes the expenditure based on available bond cash. 2. The approved ranked list demonstrates a demand for the requested project funding.
Cargo handling equipment	remaining	
Locomotives and railyards	remaining	1. A Start Letter authorizes the expenditure based on available bond cash. 2. The local agency has fully executed contracts for the equipment projects. 3. The equipment projects are within 6 months of the anticipated post-inspection date.
Ships at berth	remaining	
Harbor craft	remaining	

3. Funding recapture – ARB

It is ARB's policy that Program funds be obligated and expended in a timely manner. The ARB Executive Officer or his or her designee has the authority to recapture funds for reallocation and expenditure prior to reversion deadlines, and may amend or modify an executed grant or interagency agreement, or establish a new grant or interagency agreement, to implement this policy.

ARB may recapture and reallocate funds including, but not limited to, the following:

- Funds allocated or paid to a local agency (or State agency administering a loan project) that the local (or State) agency notifies ARB are unlikely to be spent within the Program or statutory deadlines.
- Funds allocated or paid to a local agency (or State agency administering a loan project) that ARB staff determines are unlikely to be spent within the Program or statutory deadlines, based on the local (or State) agency's progress in implementing the grant agreement. The ARB Executive Officer or his or her designee shall notify the local (or State) agency in writing of any such determination before taking action to recapture and reallocate the funds. This action may include termination of a grant or interagency agreement, or notification that the local or State agency must return unexpended funds to ARB.
- Funds returned to ARB by a local agency (or State agency administering a loan project).
- Earned interest held by ARB or a local (or State) agency, as permitted by State law and fiscal policies.
- Funds paid to an equipment owner but returned to the local (or State) agency after the funds have been liquidated.
- Other funds that may come into the Program from other sources in the future.

ARB staff shall follow the hierarchy below for allocating recaptured funds to Board-approved primary or backup projects:

- Within the same funding category and trade corridor.
- Within the same trade corridor.
- To another trade corridor ~~(with Board approval)~~.

4. Ongoing evaluations

ARB staff shall evaluate local agency and equipment projects on an ongoing basis. Evaluations are designed to meet the accountability requirements of State law and the Executive Order S-02-07. Any Program funds that local agencies expend on projects not eligible for Program funds ~~expended on equipment projects that ARB finds are not eligible for funding~~ shall be documented as an adverse finding in the local agency's Program review or fiscal audit. The ARB Executive Officer or his or her designee may require that the local agency reimburse ARB the Program funds identified in an adverse finding, or may seek other remedies from the local agency as the Executive Officer deems appropriate.

a) Ongoing evaluations of local agency projects

Ongoing evaluation of local agency projects includes reviewing local agency project records to ensure consistency with Guidelines and emission reduction goals. Evaluations may occur as ARB staff deems necessary and feasible with available resources.

Local agencies shall allow Program or fiscal audit staff, ~~permit ARB, the DOF, Bureau of State Audits (BSA),~~ or any authorized designee, access to all required records and personnel with knowledge of such records~~,~~ during normal business hours, to conduct ongoing evaluations for the purpose of monitoring the Program~~. and fiscal audits.~~

b) Ongoing evaluations of equipment projects

Ongoing evaluation of equipment projects includes reviewing equipment project records to ensure consistency with Guidelines and emission reduction goals, and site visits to inspect engines, vehicles, or other equipment funded under the Program. Evaluations of equipment projects may occur unannounced as ARB staff deem necessary and feasible with available resources.

Equipment owners shall allow local agencies, Program or fiscal audit staff, ~~permit the local agency, ARB, DOF, BSA,~~ or any authorized designee, access to all required records and personnel with knowledge of such records~~,~~ during normal business hours, to conduct ongoing evaluations for the purpose of monitoring the Program.

In addition to local agency review to ensure the appropriate registration and operation of bond funded equipment, ARB may periodically monitor, through federal, State, and local equipment registration databases, as applicable, ongoing equipment project compliance with California registration and operational requirements. Equipment registration databases may include, but are not limited to:

- California Air Resources Board databases.
- California Department of Motor Vehicle databases.
    - California International Registration Plan (California IRP).
- California Department of Fish and Wildlife databases.
- California Department of Transportation databases.
- Local agency databases, as available, such as air district permit records or port access databases.

When ARB field inspectors check trucks, locomotives, railyards, harbor craft, cargo handling equipment, and ship berths for compliance with ARB regulations or enforceable agreements, they shall also assess compliance with Program requirements for any bond-funded equipment. The inspectors, via an equipment database, shall determine if the equipment received bond funding and evaluate bond-funded equipment to ensure that all pollution controls are functioning and the equipment is meeting the Program operating conditions.

Nothing in these Guidelines is to be construed as limiting or otherwise affecting in any way ARB's enforcement authority for ensuring that equipment subject to the Program complies with all Program requirements, as well as all applicable regulations or enforceable agreements.

(1) Electronic monitoring devices

With the exception of contracts for locomotive projects and grid-based shore power projects, all equipment project contracts shall require that the equipment owner agree to the installation and use of an electronic monitoring device at any time during the equipment project contract term. Equipment project contracts for locomotives shall require equipment owners to install and use global positioning systems (GPS), and report data.

ARB staff requires the use of electronic monitoring devices on bond-funded equipment for the locomotive and harbor craft projects that allow for 90 percent California operation.

~~ARB staff recognizes the privacy concerns that equipment owners may have about any type of electronic monitoring device. ARB staff shall work with the local agencies to develop specifications for the minimum information needed to verify the 90 percent California operation. This information will be posted on ARB's website.~~

For each equipment project, all data collected from any electronic monitoring device required under this Program shall be provided to the local agency administering that equipment project and to ARB staff or its contractors for their use and analyses. Such data may include, but not be limited to, vehicle identification number (VIN); date, time, and distance traveled for each trip; GPS locational information; emissions or fuel usage rates; and other information collected from gauges, sensors, and other sources.

Data collected from these monitoring devices shall be disclosed only to the local agency and ARB staff or its contractors, except as otherwise provided by law. Such data shall be provided upon request in the form and format agreed to by the parties or as otherwise specified in these Guidelines. Each equipment project contract shall require all signatories to acknowledge their understanding and agreement to allowing the local agency and ARB staff and its contractors such access to the collected data. Nothing in this provision or these Guidelines shall be construed in any way as limiting ARB's ability to publish or release the collected data or the results of analyses using these collected data in summary form without individual personal identifiers. For purposes of this Program, "personal identifiers" include only the name of the vehicle driver or equipment operator and the driver's or operator's home address in alpha-numeric format (e.g., 1000 Apple Way), if collected.

5. Program OversightAuditing

Program oversight is ~~Audits are~~ designed to ensure that all local agency and equipment projects funded under the Program meet the requirements of these Guidelines. ARB or its designees shall audit a sufficient number of local agency projects and equipment projects each year to ensure effective Program implementation and accountability, subject to available resources.

a) Program review and fiscal ~~ARB~~ audits of local agency projects

Pursuant to H&S §39625.02(e)(1), ARB staff or its designees shall conduct local agency programmatic reviews and fiscal audits.~~Program and fiscal audits of the local agencies.~~ This may include Program reviews by ARB staff or its designees (Program review) and fiscal compliance audits by DOF (fiscal audit).

To ensure objectivity and the efficient use of resources, ARB shall use a risk-based approach to select specific local agency projects for review ~~audit~~ during a given year. Consistent with this approach, local agencies that are found to demonstrate~~ing~~ good performance in a Program review ~~when audited~~ will likely be subject to ~~audited~~ less frequent~~ly~~ reviews in the future~~, than similarly funded local agencies with poorer audit results.~~

Any Program funds that local agencies expend on projects not eligible for Program funds shall be documented as an adverse finding in the local agency's Program review or fiscal audit. The ARB Executive Officer or his or her designee may require that the local agency reimburse ARB the Program funds identified in an adverse finding, or may seek other remedies from the local agency as the Executive Officer deems appropriate.

The responsibilities of ARB or its designees during ~~an~~ Program review or fiscal audit include, but are not limited to, the following:

- Program review or fiscal audit~~Audits~~ shall be conducted in a manner that reflects the public responsibility and accountability entrusted to ARB.
- ARB or its designees shall maintain open channels of communication with the local agency ~~under audit~~; for example, fully explaining the ~~audit's~~ scope and procedures of the Program review or fiscal audit at the beginning of the process, informing the affected parties of potential issues as they unfold, affording numerous opportunities for input throughout the Program review or fiscal audit, thoroughly discussing any findings and recommendations during the exit interview, and allowing the local agency an opportunity to formally respond to the Program review or fiscal audit report.
- To ensure objectivity and predictability, ARB or its designees shall base ~~its~~ findings and recommendations on materials such as State law, these Guidelines, Generally Accepted Accounting Principles (GAAP), e-mail communications between ARB staff and the local agency or equipment owner, the local agency project application, and any local agency's own requirements.

- All final Program review or fiscal audit reports, local agency or equipment owner responses, and related documents shall be readily available to the public.
- ARB shall conduct sufficient follow-up activities, including ~~conducting~~ follow-up reviews, to ensure that any identified deficiencies are promptly and effectively addressed.

The responsibilities of a local agency during ~~an~~ Program review or fiscal audit shall include, but are not limited to, the following:

- Ensure that Program files and other requested information are readily available to Program review or fiscal audit staff.
- At a minimum, participate in the entrance and exit interviews and ensure that local agency or equipment owner staff is cooperative with Program review or fiscal audit staff.
- Communicate fully with audit staff throughout the course of ~~an~~ Program review or fiscal audit.
- Make every effort, including requesting assistance from ARB if necessary, to ensure that identified deficiencies are promptly and effectively rectified.

To assist State agencies ~~ARB~~ with the Program review or fiscal audit process, local agencies shall provide ~~to ARB staff~~, upon request, access to documentation pertaining to the Program which includes, but is not limited to, the following:

- General:
  - Organization charts.
  - Contact information for the Program and designated accounting liaisons.
  - Copies of grant agreements and any amendments between ARB and the local agency.
  - Copies of contracts and any amendments between the local agency and the equipment owner.
  - Copies of any contracts and any amendments between the local agency and subcontractors and consultants.
  - Reports filed with ARB, if applicable.
- Accounting records:
  - General ledger chart of accounts.
  - Copies of the policies and procedures for:
    - Receipt and deposit of project funds.
    - Review, approval, and payment of project invoices.
    - Calculation and allocation of Program administration costs.
    - Tracking and allocating interest earned on the Program.
  - Reports from the general ledger showing receipts, expenditures, interest earnings, and annual balances for projects and local administration during the audit period.
  - Copies of audit reports covering financial statements, operations, and internal controls during the audit period.

- Access during fieldwork to the following accounting records:
  - Invoices/claims from the local agency to ARB for Program payments, and invoices from equipment owners to the local agency.
  - Receipts/deposit slips showing payments received from ARB.
  - Invoices from subcontractors/consultants to the local agency or equipment owner.
  - Canceled checks or other expenditure documents supporting payment to the subcontractors/consultants.
  - Bank statements and reconciliations throughout the audit period.

- Program records:
  - Reports that list all projects associated with the programs showing:
    - Equipment project number.
    - Subcontractor and consultant contact information.
    - Dates, check numbers, amounts, and funding sources for each equipment project expenditure.
    - Fiscal year of the funding appropriation for the applicable grant agreement.
  - Copies of any and all records prepared by the local agency, the equipment owner, and any third parties involved in the application, review, inspection, scrappage, or payment steps.
  - Copies of the local agency procedures for review, approval, and submittal of subcontractor invoices for payment.
  - Access during fieldwork to the following Program project records:
    - Contracts between the local agency or equipment owner and the subcontractors/consultants.
    - Invoices from subcontractors/consultants to the local agency or equipment owner.
    - Requests to local agency's accounting for payment of project invoices.

The local agency shall retain all records subject to the recordkeeping requirements for local agency projects, including records to meet State and federal bond requirements. Retained records shall include, but are not limited to: local agency file reviews of annual equipment project reports, annual reports provided by equipment owners, any relevant project updates provided by equipment owners, documentation of equipment inspections, accounting records and reports for the fund accounts from which the proceeds were disbursed, and other relevant information.

The local agency agrees to maintain such records as specified in the grant agreement to support a possible Program review or fiscal audit for 35 years after the bond issuance date and to send all records to ARB by the End Date of the grant agreement in an electronic format to be determined by ARB.

Local agencies shall ~~provide~~ allow Program review or fiscal audit staff, or any other authorized designee, access to all required records and personnel with knowledge of such records ~~to ARB, DOF, BSA, or any authorized designee~~ during normal business hours, to conduct Program reviews and fiscal audits.

b) Program review and fiscal ~~ARB~~ audits of equipment projects

~~In conjunction with local agency audits,~~ ARB staff or ~~an~~ its authorized designee shall ~~also~~ use a risk-based approach to select specific equipment projects for Program review or fiscal. If ARB staff discovers non-performance issues with specific equipment projects, the local agency shall be notified to take appropriate action. If ARB staff discovers that the equipment project is not in compliance with ARB regulations, the ARB Enforcement Division shall be notified to take appropriate enforcement action.

Local agencies shall allow Program review or fiscal audit staff, or any other authorized designee, access to all required records and personnel with knowledge of such records during normal business hours, to conduct Program reviews and fiscal audits.

6. ARB reporting

ARB staff shall provide regular updates and reports on the implementation status of the Program.

a) Public website

ARB is committed to providing the public with information regarding the status of bond-funded programs. In accordance with ARB policy and Executive Order S-02-07, ARB shall provide periodic data updates on ARB's Program website: ~~http://www.arb.ca.gov/gmbond~~. At a minimum, ARB shall post:

- ARB semi-annual reports to DOF (compiled from local agency reports).
- Local agency project completion reports.
- ARB annual reports.

ARB shall also develop and maintain the Goods Movement Online Database showing information and progress on local agency projects, as well as individual equipment projects. This searchable Database will allow the public to find out about projects funded in a specific trade corridor, and the implementation status for each project.

b) ~~Annual c~~Community meetings

ARB, in conjunction with the local agencies, shall host community meetings as specified in Chapter IV.A.1.a. ~~In each trade corridor, ARB staff shall co-host along with the local agencies administering local agency projects in that corridor, at least one annual community meeting to provide an update on and opportunity to discuss implementation of the Program.~~

c) Updates to the Department of Finance

ARB shall provide semi-annual and project completion reports to DOF, based on the reports submitted by local agencies [H&S §39625.02(f)(1)-(2)].

d) ARB annual report

ARB staff shall prepare an annual report on progress made to implement the Program [H&S §39627.5]. This report shall be submitted to the Legislature and shall include the following minimum elements:

- Description of local agency projects funded by the Program, including the following information for each project:
  - Amount of Program funds allocated.
  - Location.
  - Implementation status.
  - The number of vehicles, pieces of equipment, ship berths, etc., expected to be updated.
  - Estimate of the emission reductions achieved or expected.
  - Any changes to the scope or award amounts of grant agreements.
- Total funds allocated, obligated, and expended under the Program to date.
- Actions undertaken to ensure local agency-funded projects are being implemented in a timely fashion and within the budget for Program funds.

7. Local agency non-performance

Prior to implementing any of the non-performance provisions, ARB staff shall make a reasonable effort to work with local agency staff to address and resolve any issues relating to Program implementation.

ARB staff may request a local agency to provide sufficient information to demonstrate what actions the agency will take to obligate and/or liquidate Program funds within the Program or statutory deadlines, if it appears the local agency may be unlikely to meet those deadlines.

a) Non-performance finding

If ARB staff identifies instances of local agency non-performance, ARB staff shall issue a written non-performance finding to that local agency.

Local agency non-performance includes, but is not limited to, issues with any one or more of the following areas:

- Misuse of Program funds.
- Funding of ineligible equipment projects or other items.
- Failure to comply with these Guidelines or statutes.
- Failure to meet schedule milestones identified in the grant agreement.
- Failure to obligate or expend Program funds within established timelines.
- Insufficient performance or widespread deficiencies with Program oversight, enforcement, record keeping, contracting provisions, inspections, audit procedures, or any other Program element as determined by ARB staff.
- Exceeding administration fund allotment.

- Insufficient, incomplete, or faulty project documentation.
- Failure to provide required documentation or reports requested by ARB, DOF, or other agencies in a timely manner.
- Poor performance as determined by an audit conducted by ARB, DOF or other designated agency or contractor.

b) Local agency appeal process

Upon notification of a non-performance finding, local agency staff or management may request a meeting with ARB management to dispute or discuss the validity of the non-performance finding. ~~If the~~ Any disagreements over the validity of the non-performance finding that cannot be resolved at the management level within 30 days of when the issue is first raised with ARB staff shall be subject to resolution by~~, local agency management may appeal to the~~ ARB's Executive Officer or his or her designee~~ated representative, whose decision shall be final and binding.~~ Nothing contained in this paragraph is intended to limit any of the rights or remedies that the parties may have under law.

c) Remedies for non-performance

(1) Local agency probation

ARB staff shall consider a local agency on probation at the time a non-performance finding is sent to the local agency.

The local agency on probation shall develop a corrective action plan that must be submitted to ARB within 30 days of receipt of the written non-performance finding from ARB.

ARB shall approve or disapprove with recommendations the corrective action plan within 30 business days of receipt from the local agency. To be considered for approval, the corrective action plan must include adequate, expeditious, and enforceable commitments to address the specific non-performance problems, including timeframes to complete each commitment.

If the corrective action plan is approved, ARB staff shall evaluate the local agency's performance under the approved corrective action plan, including timelines, to determine whether the local agency met its commitments and fully addressed the issues for which it was placed on probation. ARB may also impose additional requirements, depending upon the scope or severity of the local agency's non-compliance with Program requirements.

No later than 1 year from the date the local agency is originally placed on probation, ARB shall do one of the following, whichever ARB, in its sole discretion, deems appropriate:

- Remove the local agency from probation designation.
- Re-designate the local agency on probation for a period of up to one additional year.

- Re-designate the local agency on probation for a period of up to one additional year, and require that all, or a portion of, the remaining unspent Program funds available for expenditure by ARB and/or the local agency plus any unspent earned interest are either:
    - Recaptured by ARB, or
    - Revert back to the California Ports Infrastructure, Security, and Air Quality Improvement Account.

ARB may also require local agencies on probation to comply with additional requirements or stipulations prior to future ARB expenditures under existing grant agreement(s), or prior to ARB consideration of future applications from the local agency for Program funds.

If the corrective action plan is disapproved by ARB with recommendations, the local agency shall have 30 days to revise the plan according to the recommendations, and resubmit it to ARB. ARB shall approve the corrective action plan as re-submitted within 30 days, or develop a recommendation to require that all, or a portion of, the remaining Program funds available for expenditure by ARB and/or the local agency plus any unspent earned interest are either:

- Recaptured by ARB, or
- Revert back to the California Ports Infrastructure, Security, and Air Quality Improvement Account.

ARB shall make information pertaining to a local agency's probationary status available to the public.

(2) Fund reversion

Program funds automatically revert back to the California Ports Infrastructure, Security, and Air Quality Improvement Account under the following conditions:

- Funds held by ARB revert if ARB does not obligate funds or liquidate funds within the deadlines set forth in State law.
- Funds held by a local agency revert if the local agency does not obligate funds within 2 years of executing a grant agreement with ARB, or expend funds within 4 years of obligation. A local agency may return unused funds ahead of the reversion deadline if the local agency concludes it cannot spend the funds for any reason.
- Funds held by a local agency are recaptured when the local agency withdraws from the Program or its grant agreement is terminated, consistent with State law, irrespective of whether the funds have been obligated but not yet expended.

All Program funds that revert back to the California Ports Infrastructure, Security, and Air Quality Improvement Account are subject to re-appropriation by the Legislature.

ARB and local agencies are released from funding commitments in grant agreements or contracts, as applicable, for any and all funds that are reverted back to the California Ports Infrastructure, Security, and Air Quality Improvement Account. This release does not apply to any contractual obligations the local agency may have with the equipment owner or operators.

(3) Future grant opportunities

A local agency's track record in administering Program funds shall be a factor in ARB's consideration of subsequent applications from that local agency for future funds. ARB may require local agencies with a current or prior probation designation to comply with additional requirements or stipulations, prior to ARB consideration of future fiscal year Program funds. This may include:

- Exclusion of a local agency from participation in the Program due to past non-performance issues.
- Based on the specific types and seriousness of a local agency's past non-performance issues, limitation(s) on future grant funding opportunities, levels, volume(s), or other limitation(s), as determined by ARB on a case-by-case basis.
- The track record of the local agency may also be considered by ARB in conducting its audits of the local agency.

8. State agency non-performance

Prior to implementing any of the non-performance provisions, ARB staff shall make a reasonable effort to work with State agency staff to address and resolve any issues relating to Program implementation.

ARB shall issue a written non-performance finding if ARB staff identifies instances of non-performance.

State agency non-performance includes, but is not limited to, issues with any one or more of the following areas:

- Failure to comply with these Guidelines or statutes.
- Failure to obligate or expend Program funds within established timelines, or to show timely interim progress to meet these timelines.
- Insufficient performance or widespread deficiencies with Program oversight, enforcement, record keeping, contracting provisions, inspections, audit procedures or any other Program element as determined by ARB.
- Misuse of Program funds.
- Funding of ineligible projects or other items.
- Exceeding administration fund allotment.
- Insufficient, incomplete, or faulty project documentation.
- Failure to provide required documentation or reports requested from ARB, DOF, or other agencies in a timely manner.
- Poor performance as determined by an audit conducted by ARB, DOF, or other designee.

Remedies for non-performance include:

- Recovery of funds
- Constraints on opportunity to compete for future Program funds.

III. Local Agency Project Proposal

Local public entities shall successfully register with ARB according to instructions described in the notice of funding availability (NOFA) before submitting an application for Program funds.

Note: Since the applications will require a substantial investment of time by the local public entity, ARB staff encourages each entity to consult early with ARB staff regarding its ability to meet the requirements of the statute and the Guidelines to qualify as an applicant.

A. Local Agency Registration

Interested local public entities shall submit registration information as required by the NOFA sufficient for ARB staff to assess the entity's qualification as a local public entity, by the deadline identified in the NOFA.

1. Existing or returning local agency~~ies~~ registration

Local public entities that have successfully registered as local agencies in the Program for past funding cycles do not need to resubmit registration information. These agencies shall submit the following information:

- Letter of intent to ARB to compete for Program funds for the funding cycle(s) announced in the NOFA.
- Any appropriate updates to the agency contact information.
- Any additional documentation requested by ARB staff.

2. New local agency registration

Local public entities that have not previously registered as local agencies in the Program shall provide sufficient information to demonstrate to ARB that they are eligible to apply as a local public entity. Registration information shall include, at a minimum, the following:

- Type of local agency (air district, seaport, transportation agency, etc.).
- Jurisdiction, including geographic boundaries and trade corridor.
- Mission statement or purpose.
- General information on the entity (total budget, overall work plan or program, etc.).
- Legal citations and text which establishes that the local public entity has the legal authority to implement a regional scale incentive program for freight movement sources that includes: project solicitation, competition for funding, funding awards, execution of contracts, and equipment inspections across the entire trade corridor where the local public entity is based.

- A description of how the local public entity is involved in freight movement or air quality improvements associated with goods movement, as required by the statute. This description shall include the entity's specific roles, authorities, responsibilities, and annual budget for goods movement air quality projects.
- A statement as to whether the local public entity fulfills the additional requirements of these Guidelines and further qualifies as an applicant because it:
    - Is directly responsible for operating a freight movement facility (e.g., seaport or airport); or
    - Has statutory authority for designing and implementing strategies and/or plans to reduce emissions or health risk from air pollution sources (e.g., local air pollution control district and air quality management district); or
    - Has statutory authority for planning and funding regional goods movement infrastructure projects (e.g., regional transportation planning agency).
- Local public entity contact information.

Local public entities shall provide any additional documentation not described above upon request by ARB.

~~Local public entities shall successfully register with ARB staff prior to submittal of a project application.~~

3. New State agency registration

For the purpose of administering a loan or loan guarantee program only, any State agency, including ARB, is eligible to apply for Program funding. All State agencies shall provide the information in the NOFA to register.

B. Legal and Program Restrictions

In the application for funding, local agencies shall certify that the proposed local agency project would meet the requirements of the statute and the Guidelines. This section discusses the legal and Program restrictions on eligible projects.

1. Legal restrictions

Local agencies shall certify that the local agency project would achieve emission reductions not otherwise required by law or regulation [H&S §39625.5(a)(1)]. "Not otherwise required by law or regulation" means the emission reductions are not required pursuant to any local, State, or federal law, rule, or regulation; any requirements imposed by the California Environmental Quality Act (CEQA); or any requirements imposed by a legal instrument such as a legal settlement or consent decree (collectively referred to as "law or regulation"). For purposes of this Program only, "not otherwise required by law or regulation" does not apply to any tariff, ordinance, or other requirement imposed by a local agency based on that local agency's authority as a market participant or municipal proprietor or the local agency's authority to enter into contracts with equipment owners and operators.

The following are examples of laws or regulations that may prohibit equipment projects that would otherwise be eligible for funding under this Program. Chapter III.B.1.d. below discusses Program funding for equipment projects that may be subject to future ARB regulations.

a) Environmental mitigation

Local agencies shall not request or expend Program funds for equipment projects that are required as a specific ~~California Environmental Quality Act (~~CEQA~~)~~ or National Environmental Policy Act (NEPA) mitigation measure in a certified CEQA or NEPA document.

b) Railroad agreements

For locomotives, the statute specifically requires ARB to determine that the emission reductions that would be achieved by the locomotive equipment project are not necessary to satisfy any mandated emission reduction requirement under an agreement between a railroad company and a state or federal agency, or a local air district [H&S §39625.5(a)(2)(B)].

ARB has signed two Memoranda of Understanding (MOU) with the Class I railroads – Union Pacific ~~(UP)~~ and ~~Burlington Northern Santa Fe (~~BNSF Railway~~)~~ – to reduce the emissions and health risks from locomotive operations. Program funding shall not be used for idle reduction technology on locomotives (required by the 2005 MOU) or for cleaner locomotives credited towards the railroads' compliance with the 2010 fleet average emission standard for the South Coast Air Basin (required by the 1998 MOU). Locomotive repowers or replacements that go beyond the itemized requirements of these agreements shall be eligible for bond funding.

c) Existing ARB regulations

Local agencies shall not request or expend Program funds for equipment projects that are used to directly comply with existing regulations. The Program can co-fund eligible equipment subject to existing or future regulations, but only if the equipment upgrades are early (completed a set time prior to the compliance date) or extra (the upgrade must go beyond the regulatory requirements, as described in these Guidelines).

Existing ARB regulations that are currently in place for the following source categories applicable to this Program include, but are not limited to:

- New heavy-duty diesel vehicles – *Exhaust Emissions Standards and Test Procedures -1985 and Subsequent Model Heavy-Duty Engines and Vehicles* (Code of Regulations (CCR), title 13, division 3, chapter 1 §1956.8).
- In-use on-road heavy-duty trucks and buses – *Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants from In-use Heavy Duty Diesel-fueled Vehicles* (CCR, title 13, division 3, chapter 1, article 4.5, §2025).
- Trucks serving ports and intermodal railyards – *In-Use On-Road Diesel-Fueled Heavy-Duty Drayage Trucks* (CCR, title 13, division 3, chapter 1, article 3 §2027).
- Heavy-duty truck idling – *Requirements to Reduce Idling Emissions from New and In-Use Trucks, Beginning in 2008* (CCR, title 13, division 3, §1956.8, §2404, §2424, §2425, and §2485).
- Truck smoke and emission control inspections – *Heavy-Duty Diesel Smoke Emission Testing, and Heavy-Duty Vehicle Emission Control System Inspections* (CCR, title 13, division 3, chapter 3.5, §§2180-2189) and *Periodic Smoke Inspections of Heavy-Duty Diesel Powered Vehicles* (CCR, title 13, division 3, chapter 3.6, §§2190-2194).
- Cargo handling equipment – *Regulation for Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards* (CCR, title 13, division 3, chapter 1 §2479).
- Ships at berth (shore power) – *Airborne Toxic Control Measure for Auxiliary Diesel Engines Operated on Ocean-Going Vessels At-Berth in a California Port* (CCR, title 13, division 3, chapter 5.1, §2299.3 and title 17, division 3, chapter 1, subchapter 7.5, §93118.3).
- Commercial harbor craft engines – ~~*Emission Limits and Requirements for*~~*Regulations to Reduce Emissions from Diesel Engines on Commercial Harbor Craft Operated Within California Waters and 24 Nautical Miles of the California Baseline* (CCR, title 13, division 3, chapter 5.1, §2299.5 and title 17, chapter 1, division 3, subchapter 7.5, §93118.5).

Information regarding existing ARB regulations for specific source categories can be found on the following ARB website: http://www.arb.ca.gov/diesel/mobile.htm, or in the California Code of Regulations through the Office of Administrative Law: http://www.oal.ca.gov/ccr.htm.

d) Upcoming ARB regulations

Local agencies may request and expend Program funds for equipment upgrades that may be required by a future ARB regulation up until the date of Board action to adopt the regulation.

As of the date of Board action, only equipment projects with executed contracts between the equipment owner and local agency shall be exempt from project completion timing requirements (e.g., specified months or years prior to the adopted regulatory compliance date for that equipment upgrade).

Once the Board has taken action to approve a regulation, subsequent equipment projects shall be subject to the project completion timing requirements identified in the equipment project specifications or include emission reductions that go beyond the regulatory requirements.

Information regarding upcoming ARB regulations for specific source categories can be found on the following ARB website: http://www.arb.ca.gov/diesel/mobile.htm.

2. Program restrictions

The local agency shall solicit, accept applications, and fund equipment projects from all equipment owners who meet the eligibility requirements defined in these Guidelines, subject to the local agency project described in the grant agreement as well as the project evaluation and competitive ranking process. Notwithstanding the above, a local agency may exclude from funding eligibility any equipment owner who has a demonstrated inability to meet contractual obligations with the local agency.

A local agency shall not propose or implement any requirements that are inconsistent with these Guidelines, including, but not limited to:

- A local agency applying for Program funds cannot limit the request for funds to only certain equipment project options within source and funding categories. A local agency must administer projects for the entire funding category in the trade corridor.
- A local agency shall not restrict funding eligibility to a preferred individual, company, business entity, or other defined group of equipment owners.
- A local agency shall not accept equipment project applications for equipment that is under a contractual obligation with this Program, the Carl Moyer program, the Voucher Incentive Program (VIP), or any other ARB incentive programs.
- Other than the exceptions specifically described in Chapter III.C.4., a local agency shall not restrict funding eligibility to equipment that operates solely or primarily within its jurisdictional boundaries.
- A local agency shall not restrict equipment projects to replacement or retrofit equipment manufactured or sold by a specified company or companies. The local agency shall allow all eligible equipment projects that meet the emissions performance level detailed in the project specifications of these Guidelines to compete for Program funding.
- A local agency shall not restrict equipment projects to equipment sold by a truck dealer or retrofit vendor with a contract or MOU to do pre-inspections.
- The local agency shall not propose or allow equipment projects to be completed less time in advance of a regulatory requirement than provided for in the project specification.
- A local agency shall not impose travel restrictions on Program-funded equipment beyond the operating limitations defined in these Guidelines and any approved alternatives described in Chapter III.C.4. For example, a local agency cannot restrict the travel (or a portion of the travel) of trucks or line-haul locomotives to within a single city, county, air district, air basin, trade corridor, or similar geographic area that is smaller than the four trade corridors or the State of California.

- A local agency shall not fund equipment projects failing to meet the minimum equipment project requirements listed in Appendices A-HF. In conjunction with the minimum equipment project requirements, a local agency shall not fund higher emitting equipment, pay more per piece of equipment, modify the project life options, remove the project eligibility and other requirements, or relax the operating conditions as compared to the specifications in these Guidelines for each equipment project option.
- A local agency shall not impose non-air quality requirements (like fees or employee drivers) on Program-funded equipment projects.

C. Project Alternatives for Local Agencies

Under this Program, a "local agency project" is defined as the funding category-specific incentive program that the local agency proposes to implement with Program funding.

These Guidelines limit eligibility for Program funds to equipment with recent operation in one or more trade corridors. Except as described in Chapter III.B.1. and Chapter III.B.2., local agencies may customize their proposal(s) for each funding category, by incorporating any of the Program alternatives listed below, if clearly stated in the application and approved by ARB staff.

ARB staff may, at its discretion, expand the following list of alternatives to include additional items that do not fundamentally alter the equipment project eligibility criteria, the equipment project requirements and operating conditions, or the effectiveness of those provisions in reducing emissions.

1. Technology alternatives

The local agency must solicit, evaluate, and fund applications for all equipment project options within a funding category. The local agency may propose to customize its proposal by incorporating any of the following approved technology alternatives:

- A local agency may propose to offer non-Program funding for equipment that meets an emissions performance standard that requires lower emissions than the specifications in these Guidelines, provided the technology to meet that standard is demonstrated, verified by ARB (if applicable) and commercially available. This alternative is subject to the following restrictions:
  - The local agency shall not propose to offer Program funding at a level for each equipment project that exceeds the funding caps in these Guidelines.
  - The local agency shall not require equipment meeting lower emission standards than the emissions levels for the equipment project options in these Guidelines.
  - The local agency shall not propose to restrict eligibility for Program funding to equipment projects that utilize the additional funding to meet the lower emission standards (i.e., any equipment project that meets the minimum specifications established in these Guidelines must be eligible to compete for Program funding administered by the local agency for that funding category).

For example, a local agency could propose a truck program that does not require but offers additional funds for replacement with natural gas; with the Program paying up to the maximum $60,000 per truck and the local agency providing funding from another, non-State source for the incremental cost of natural gas. Following ARB approval of the local agency project, the local agency shall solicit equipment applications for both the lower emission natural gas replacement approach as well as the truck replacement approach listed in the Guidelines.

- A local agency may propose to offer non-Program funding for equipment monitoring or tracking devices (like ~~global positioning systems (~~GPS~~)~~ or radio-frequency identification (RFID) devices). In this case, the local agency shall commit to monitor the equipment for the project life. The local agency shall also make provisions acceptable to ARB staff for access to the data collected on individual vehicles, vessels or equipment and periodic data reports.
- A local agency may propose to offer non-Program funding for efficiency upgrades, like aerodynamic devices on trucks.

2. Project implementation approaches and use of contractors

A local agency project implementation approach is defined as the mechanism(s) a local agency may propose to implement a local agency project. For example, as part of a single local agency project, a local agency may propose to directly administer grants to truck owners for replacement projects and to hire a contractor or other third party to run a truck retrofit program. Each of these is an implementation approach.
The local agency may propose to customize its proposal by incorporating any of the following approved implementation approaches and use of contractors, if clearly stated in the application and approved by ARB staff:

- A local agency may propose a combination of implementation approaches to target recruitment of eligible projects and administration of funds for selected projects.
- The local agency may apply for Program funds to be administered in full or in part by a third party contractor or contractors, but shall retain full responsibility for the Program requirements and deadlines specified in these Guidelines and executed grant agreements with ARB. Any third party overhead and administration costs shall count against the cap established in these Guidelines for local agency administration funds.

Program requirements for implementation approaches:

- Regardless of the local agency's use of multiple implementation approaches or third party contractors, the competitive ranking process must take place across the entire funding category to ensure fair and equitable competition between eligible equipment projects.
- The local agency shall not commit or obligate Program funds to specific project implementation approaches or third party contractors prior to the completion of the competitive ranking process.

For example, as part of a single local agency project, a ~~port~~ local agency may propose to employ three contractors to run truck replacement programs – one focused on a lease-to-own program for diesel trucks, one on leasing natural gas trucks, and one on offering grants to truck owners for the purchase of new trucks. These contractors can each market their project implementation approach and solicit applications for eligible truck projects, consistent with these Guidelines and the project grant agreement. The ~~port~~ local agency must then competitively rank the applications from all three contractors together to determine which specific equipment projects will be funded. The contractors can then administer the funding for the equipment projects selected from the competitive process.

3. Procedure/process alternatives

The local agency may propose to customize its proposal by incorporating any of the following procedure/process alternatives, if clearly stated in the application and approved by ARB staff:

- A local agency can shorten the time allowed from execution of the equipment project contract to the project becoming operational, consistent with typical and customary schedules to complete such projects.
- A local agency can expand the list of information required on an equipment project application or the reporting requirements for equipment options.
- A local agency can expand the equipment inspection or scrappage requirements.

4. Geographic operations

For clarity, this section describes both the geographic requirements that a local agency must implement and the specific situations where the local agency may propose to customize its proposal by incorporating geographic alternatives. The local agency application shall clearly describe (if applicable) any proposed geographic alternatives. ARB staff expects that local agencies will propose to administer local agency projects for equipment that operates in the trade corridors, including the corridor where the local agency has jurisdiction.

These Guidelines limit eligibility for Program funds to equipment with recent operation in one or more trade corridors. Except as described below, a local agency may not propose or implement a local agency project that restricts access to Program funding to equipment operating at a single facility or within a single city, county, air district, air basin, trade corridor, or similar geographic area that is smaller than the four trade corridors or the State of California.

- **Trucks**. A local agency that applies for truck funds shall recruit eligible trucks that travel within the trade corridor and eligible truck stop/distribution centers within the trade corridor where the local agency has jurisdiction. The local agency shall accept applications and fund all eligible trucks that travel within the four trade corridors, regardless of where those trucks are based, subject to review of equipment project

applications and the competitive ranking process. A local agency may propose to add an eligibility requirement that the old truck must have traveled at least 10 percent of its annual miles within the trade corridor where the local agency has jurisdiction. This requirement would be added to the base Program requirements that the old truck traveled at least 75 percent of its annual miles within California and the new truck travel at least 50 percent of its annual miles within the four trade corridors as well as 90 percent or 100 percent of its miles in California, as applicable. A local agency may require that truck stops and distribution centers eligible for funding be located within the trade corridor where the local agency has jurisdiction.

- **Locomotives**. A local agency that applies for locomotive funds may require that both the old and new switcher locomotive operate full-time within the trade corridor where the local agency has jurisdiction, except for periodic maintenance in another region or neighboring state. A local agency may propose to offer an option for 90 percent future operation in California ~~at a reduced funding amount with the requirement for~~ All locomotive projects require the equipment owner to install~~ation of a global positioning system (~~ a GPS device), fund data collection, and report location data. The local agency may also require that both the old and new medium horsepower or line-haul locomotive operate at least 10 percent of the time in the corridor where the local agency has jurisdiction, and full-time within California, except for periodic maintenance in a neighboring state. The local agency shall recruit all eligible medium horsepower and line-haul locomotives operating in the trade corridor, regardless of where in California the locomotives are based. The local agency shall similarly fund all eligible medium horsepower and line-haul locomotives serving that trade corridor and others, subject to review of equipment project applications and the competitive ranking process. A local agency may require that railyards eligible for funding install a locomotive emissions capture and control system located in the trade corridor where the local agency has jurisdiction.
- **Harbor craft**. A local agency that applies for harbor craft funds may propose to restrict eligibility to vessels that are home-ported in the trade corridor where the local agency has jurisdiction. A local agency may propose to offer an option for 90 percent future operation in California ~~at a reduced funding amount~~ with the requirement that the equipment owner ~~for the~~ installation ~~of a global positioning system (~~ a GPS device), fund data collection, and report location data.
- **Ships at berth**. A local agency that applies for ships at berth funds may restrict eligibility to seaports within the trade corridor where the local agency has jurisdiction.
- **Cargo handling equipment.** A local agency that applies for cargo equipment funds may restrict eligibility to equipment operating at ports and railyards within the trade corridor where the local agency has jurisdiction.

Note: Because seaports can apply directly to ARB, but railroads cannot, a seaport applying to administer projects within the combined ships at berth and cargo handling equipment funding category must solicit, evaluate, and fund equipment projects at any seaport or railyard within the trade corridor where the local agency has jurisdiction.

D. Local Agency Pre-Application Community Meeting

The local agency shall hold at least one community meeting prior to the **submittal** of the local agency project application to solicit public input on the funding categories to be addressed in the local agency project proposal. The local agency shall consider public input as it develops the local agency project application.

At a minimum, the local agency project application shall identify when and where the community meeting(s) was held, and what methods were used to advertise the meeting(s). The application shall also include documentation of the attendance and the comments received.

E. Local Agency Project Application

Local public entities that have successfully registered shall submit **two complete local agency applications** with an original signature by an authorized local agency representative **for each funding category**. Applications shall be submitted to ARB by the NOFA deadline and according to the instructions contained in the NOFA. The completed application shall include the following:

- Completed application, including a written acknowledgement that ARB staff may pro-rate the proposed local agency project at a lower level of funding and proportionally lower performance measures (vehicles, equipment, harbor craft, or berths to be updated; and the resulting emission reductions).
- Local agency board/commission resolution (see Chapter III.E.9.).

All application information shall be provided or the application shall be considered incomplete. Updates to any application information after the submittal deadline shall only be allowed on a case-by-case basis, at the discretion of ARB staff.

The local agency project application shall include, at minimum, the following information.

1. General information

a) Existing or returning local agency application

Local agencies with prior experience administering the Program shall include a brief description of such experience, including source categories and associated funding amounts.

b) New local agency application

The local agency shall include general information about the local agency consisting of, at minimum, the following:

- A description of the local agency's experience administering other incentive programs. If the local agency has implemented more than one type of incentive program, describe the program that is most similar to the project proposal first; then any other incentive programs. At minimum, the description of prior experience shall include:
  - Purpose of the incentive program (equipment upgrades, new technologies, etc.).
  - How long the local agency has administered the program.
  - Annual funding amounts.
  - General description and quantification of the equipment purchased through the program.
  - Successful outreach strategies used to solicit participation.
  - Overview of the monitoring and reporting under the program.
- Staff contact information.

The State agency shall include general information about the State agency consisting of, at minimum, the following:

- Type of State agency (environmental, finance, business, transportation, etc.).
- Mission statement or purpose.
- General information on the entity (type of programs and budget).
- A description of how the State agency is involved in providing financial assistance, such as grants or loan or loan guarantee programs. This description shall include the agency's specific roles, authorities, responsibilities, and annual budget for these programs.
- State agency contact information.

2. Project proposal

The local or State agency shall provide the following information about the agency's proposed project. The local or State agency shall at a minimum:

- Identify the trade corridor(s) targeted.
- Identify the funding category(s).
- ~~Identify any proposed project implementation approaches.~~
- ~~Identify and detail any proposals to allow lease-to-own programs.~~
- ~~Identify any proposed project alternatives consistent with Chapter III.C.~~
- Describe the air quality problems and key contributing pollutants in the trade corridor.

- Describe how the project is consistent with local and regional plans to reduce emissions from goods movement activities, or consistent with the regional strategies in ARB's 2006 *Emission Reduction Plan for Ports and Goods Movement in California* or the State Implementation Plan. At minimum, this description shall include the strategies or measures identified in these goods movement plans that are addressed by the local agency project proposal.
- Other related information requested by ARB staff.

3. Provisions to customize proposal

The agency application shall clearly indicate, for each funding category, if the agency is proposing to customize its proposal by incorporating any of the approved Program options described in Chapter III.C.:

- Technology alternatives.
- Project implementation approaches and use of contractors.
- Procedure/process alternatives.
- Geographic operations.

The application shall describe the reasons for each alternative proposed.

4. Funding demonstration

The local or State agency shall include a funding demonstration for each project.

Elements of funding demonstration. This funding demonstration shall include, but is not limited to:

- Documentation of the local or State agency's fiscal ability to implement the proposed local agency project.
- A copy of the local agency's most recent final fiscal audit.

a) Program funds requested

- The total cost of the project, ~~including~~ based on the estimated per unit cost for new equipment. For grid-based shore power projects and harbor craft projects, the local agency may estimate the total cost of the project in the anticipated completion year.
- The amount of Program funds requested from ARB, including the breakdown of equipment project funds and administration funds, subject to the limits in these Guidelines.

b) Match funding requirements

The local or State agency shall identify all non-Program match funding and provide the following minimum documentation:

- The specific sources of the matching funds, including private, federal, local, applicable other State, and non-applicable other State (see Chapter IV.A.6. regarding which types of other State funding are applicable for purposes of calculating the cost-effectiveness under this Program). If a local air district proposes to co-fund projects with the monies derived from the $2 surcharge on vehicle registration fees authorized by AB 923 (Chapter 707, Statutes of 2004), these monies must be identified as applicable other State funds in this demonstration.
- For each source of match funding, other than from the equipment owner:
  - Name of the program.
  - The amount.
  - Any conditions or restrictions associated with its use.
  - Any timeframe requirements associated with its expenditure.
- A demonstration that all non-Program match funds, other than from the equipment owner, are reasonably available within the timeframes of the project schedule.

Equipment owner match funding for truck projects is assumed to be 50 percent of the total cost of the project, but may vary as these projects are not subject to a 50 percent funding cap. Therefore, equipment owner match funding listed in the local agency's grant agreement is an estimate and the local agency is not required to supplement these funds if the estimate is less than what is provided in the agency application and in the grant agreement.

If a local agency wishes ARB to consider the availability of non-private match funds as a supporting factor in its allocation and award of Program grants, the local agency must submit the following additional documentation:

- For each entity identified as a source of matching funds, attach the entity's approved governing board or commission resolution (if a public agency) or a letter signed by an authorized representative (if a federal agency), stating:
  - A commitment from the entity to provide such funds for the stated purpose, including the amount, any conditions and restrictions associated with their use, and any timeframe requirements associated with their expenditure.

ARB staff may, on a case-by-case basis, allow the written commitment to be submitted up to 20 ~~calendar~~ days after the application deadline.

These funds shall be considered required match funding and any changes must be approved by ARB.

5. Air quality benefits

The local agency shall use the Goods Movement Online Database to quantify the emission reductions and cost-effectiveness of a proposed local agency project. The local agency shall enter the required funding and project information into the Database. Based on that information, the Database will calculate the estimated air quality benefits and cost-effectiveness for the local agency project.

If a local agency identifies an eligible project that cannot be quantified with the Database for that funding category, the local agency should contact ARB staff for guidance. Any State agency applying for funds to administer a loan or loan guarantee program should contact ARB staff for assistance to determine the benefits and cost-effectiveness.

6. Staff resources

The local agency application shall identify and describe the staff resources necessary to effectively implement the local agency project proposal. This includes documentation of existing and planned staffing, with an indication of when planned staff will be hired.

The local agency shall affirmatively demonstrate that the agency has or will have the necessary resources in place to meet the demands of the project(s) type and scope. The staff demonstration shall be based (if applicable) on the local agency's prior experience implementing incentive programs that are similar to the funding category in the proposal. A local agency without prior experience implementing incentive programs for the proposed funding category should contact ARB or a local agency in the region to obtain assistance with assessing the staff resources the agency will need to meet the demands of the project(s).

The local agency shall provide documentation regarding the relationship between the number of pieces of equipment that can be upgraded in a given timeframe and the number of staff needed to accomplish those upgrades. The information shall include, but is not limited to, the following (based on experience):

- ~~Purpose of the prior incentive program(s).~~
- ~~Time administering the prior program(s).~~
- ~~Total incentive funds administered by the local agency under the prior program(s) in the last 2 years.~~
- ~~Total pieces of equipment contracted under the prior program(s) in the last 2 years.~~
- Total staff positions (in equivalent PYs) assigned to implement incentive funds under the prior program(s) in the last 2 years.
- Plans to hire or contract additional staff to implement funding requested.
- ~~List of staff classifications, in equivalent PYs, that are available or will be available to implement the project, including:~~
    - ~~Program staff (marketing/outreach, grants, contracts, inspections, audits, etc.).~~
    - ~~Managerial staff.~~
    - ~~Administrative support staff.~~
    - ~~Fiscal and accounting staff.~~

7. Project schedule

At a minimum, the local agency project schedule shall provide the approximate number of weeks necessary to accomplish each of the milestones identified below (following the execution of grant agreements and the receipt of the project Start Letter from ARB).

- Equipment project solicitation period, including marketing/outreach.
- Equipment project application review period.
- Competitive ranking and selection of equipment projects and webposting.
- Equipment owner notification period.
- Equipment pre-inspection period.
- Contract signature period.
- Equipment post-inspection period.
- Liquidation period.

The State agency project schedule shall identify the key milestones and the approximate number of weeks necessary to accomplish each of the milestones, following the execution of an interagency agreement (where applicable) and notification from ARB that there is bond funding available to begin the project.

8. Certification to comply with Program requirements

The local agency shall include a certification that it has the ability and intent to fully and effectively satisfy each of the local agency project implementation requirements detailed in these Guidelines including, but not limited to, those listed below. Local agencies currently administering incentive programs similar to this Program may use existing policies and procedures that are modified to reflect the unique requirements of this Program.

- Support public participation.
- Conduct marketing and solicit equipment project applications (including targeted outreach and assistance to independent truck owner-operators).
- Review and competitively rank project applications (including web posting).
- Select equipment projects for funding, including any local board/commission approval process.
- Conduct equipment pre-inspections and compliance checks.
- Notify equipment owners of the status of their application.
- Execute equipment project contracts.
- Ensure equipment scrappage where required.
- Conduct post-inspections of new or upgraded equipment.
- Request expenditures from ARB.
- Process invoices and requests from equipment owners for payment (including direct payments to vendors and reimbursements).
- Calculate and report earned interest.

- Evaluate equipment projects and assess on-going compliance with contract conditions.
- Provide required reports to ARB (including the ability to submit equipment project data electronically when requested).
- Participate in Program and fiscal audits and evaluations.

A State agency shall include a certification that will comply with all requirements that are applicable to loan or loan guarantee projects. State agencies shall also include a description of proposed actions to evaluate loan and loan guarantee projects on an ongoing basis to meet the accountability requirements of SB 88 and the Governor's Executive Order S-02-07.

9. Local agency board/commission resolutions

The local agency shall provide ARB with a resolution of the local agency governing board or commission that authorizes the local agency to enter into a grant agreement with ARB, accept funds, and provide any matching funds under the fiduciary control of the local agency that are identified in the local agency project funding demonstration.

The local agency resolution shall also clearly identify the local agency's board/commission role or board/commission delegations to local agency staff for the following:

- The local agency representative authorized to sign and submit the local agency project application.
- The local agency representative authorized to sign/execute a grant agreement between ARB and the local agency.
- The approval of a competitively ranked equipment project list indicating the equipment projects selected for funding and a backup list of eligible equipment projects.
- The local agency representative authorized to sign/execute an equipment project contract between the local agency and equipment owner.
- The local agency representative authorized to sign Grant Expenditure Requests and delegate signature authorization to others.

The local agency resolution shall also identify all sources and amounts of non-private matching funds committed to Program projects, and shall state any conditions and time constraints associated with those funds.

ARB staff may, on a case-by-case basis, allow a local agency to submit its approved resolution up to 20 ~~calendar~~ days after the application deadline.

For loan projects, if required by the State agency that is accepting the funds, the State agency will provide ARB with a resolution or similar document that authorizes the State agency to enter into an interagency agreement with ARB and accept funds.

IV. Local Agency Project Implementation

A. Project Implementation Requirements

1. Community and public participation

a) Public participation

The local agency shall identify and implement mechanisms for the public to provide input to the local agency on the equipment project solicitations, the competitively ranked list of equipment projects, the periodic progress reports, and the equipment project status updates on the ARB website (and the local agency website, if applicable).

~~The local agency shall also commit to co-hosting with ARB staff at least one community meeting in the trade corridor each year to provide updates on the implementation of the local agency project.~~

b) Public website

The local agency shall maintain a Program website available to the public. Prior to the first solicitation for projects, the local agency shall include an easily identifiable Program hyperlink visible and active directly from the agency's main webpage (or the main page for incentive programs). The website shall contain, at a minimum, the following information:

- Local agency contact information.
- A link to ARB's Program website (http://www.arb.ca.gov/gmbond).
- Information pertaining to equipment project solicitations.
- The competitively ranked equipment project list(s), when available.

To enhance outreach efforts and Program transparency, the local agency shall submit a website link to ARB containing specific local agency program information, including information on community meetings or public workshop announcements which will then be posted on ARB's Program website.

2. Equipment project marketing tools

The local agency shall use marketing strategies that specifically target the owners of Program-eligible equipment covered by the local agency project, and operating in the trade corridor, regardless of where that equipment is based.

Local agencies shall provide technical and administrative assistance to equipment project applicants to help them understand and apply for equipment projects.

a) Marketing tools

Local agencies shall advertise the Program to a broad and diverse audience. The local agency's strategies should include some of the marketing tools below:

- Develop and maintain list of interested parties.
- Use web-based marketing.
- Advertise and post announcements in local newspaper(s) and trade journals, including non-English publications.
- Use radio advertisements.
- Issue public notices.
- Distribute brochures/fact sheets/community newsletters.
- Partner with trade associations, dealerships, truck stops, ports, and railroads.
- Hold outreach events at locations where targeted audience(s) typically congregate.
- Use direct mail campaign(s).

b) Outreach to independent truck owner/operators

For truck programs, the local agency shall design and implement a targeted outreach program for independent owner/operators to inform them about Program funding opportunities and to assist them in completing equipment project applications. The local agency should hold some outreach events outside of normal working hours to allow more independent owner operators to attend.

The outreach information shall include, at a minimum, the Program funding available, equipment and operating requirements, and application deadlines. Marketing tools to reach this audience may include, but are not limited to:

- Education and application assistance via a kiosk set up near a location where independent truck drivers congregate.
- A toll free number for equipment project applicants to check the status of applications or get phone assistance in completing an application, including access in languages other than English.
- A notice in local papers or other written material of funding availability (including papers published in languages other than English).

c) Information on truck efficiency upgrades

For truck programs, the local agency shall make information available to equipment owners regarding upgrades to improve fuel efficiency, especially for long-haul trucks. Technologies that improve fuel efficiency for trucks may include devices that reduce aerodynamic drag and rolling resistance. Aerodynamic drag may be reduced using devices such as cab roof fairings, cab side gap fairings, cab side skirts, and on the trailer side, trailer side skirts, gap fairings, and trailer tail. Rolling resistance may be reduced using single wide tires or low-rolling resistance tires and automatic tire inflation systems on both the tractor and the trailer. These upgrades offer the potential to cut emissions of greenhouse gases and criteria pollutants, with a 2 to 3 year payback period through lower fuel costs. The benefits are variable based on the type of truck operations.

On December 11, 2008, ARB adopted a *Regulation To Reduce Greenhouse Gas Emissions From Heavy-Duty Vehicles (CCR, title 17, section 95300)*. The regulation applies primarily to owners of 53-foot or longer box-type trailers requiring their trucks and trailers to become more fuel efficient. Truck owners may be responsible for replacing or retrofitting their affected vehicles with efficiency upgrades that fit their operating profile. While this Program does not provide funding for the efficiency upgrades, other incentive programs may help offset the purchase cost or help finance the purchase of the upgrades, including ARB's Providing Loan Assistance for California Equipment (PLACE) Program (http://www.arb.ca.gov/ba/loan/on-road/on-road.htm).

d) Outreach to small businesses for infrastructure construction

AB 761 (Chapter 611, Statutes of 2007) imposes requirements on State agencies awarding bond-funded contracts to encourage the participation of small businesses in the construction of the State's infrastructure. Government Code Section 14838.1. Under SB 88, ARB cannot directly award contracts to build infrastructure under the Program and is therefore not subject to the requirements of AB 761. However, ARB can impose requirements to meet the spirit of the law when it provides funds via grant agreements to local agencies to build the electric infrastructure to support both grid-based shore power for ships at berth and electric truck pedestals at truck stops or distribution centers.

For grid-based shore power and truck ~~stop/distribution center~~ electrification infrastructure projects, the local agency shall design and implement a targeted outreach program to encourage small businesses to participate in the construction, alteration, demolition, repair, or improvement of the project infrastructure funded by the bond Program. Outreach shall include advertising opportunities to bid for projects (as applicable), providing the bidding procedures, and providing California small businesses with information on available training and technical assistance for understanding and bidding on contracts.

A local agency that receives funding for these equipment project types shall keep statistics on small business and microbusiness participation in any contracts for this equipment installation. The local agency shall include these statistics in project data updates and reports to ARB.

Additional information on outreach requirements for ships at berth and cargo handling equipment projects can be found in Supplemental Procedures available on the Program website.

3. Local agency solicitation of equipment projects

A local agency must solicit applications for equipment, evaluate, and fund eligible applications for all equipment project options within the funding category, and base project selection on the competitive ranking process.

A local agency may conduct more than one solicitation for each Program grant, unless otherwise indicated in a grant agreement. If multiple solicitations are conducted, the subsequent solicitation shall not occur before the prior one is closed, unless the demand for funds is less than the amount available and the local agency obtains approval from ARB staff. ARB encourages additional solicitations be held in coordination with all local agencies.

- ARB staff may include a requirement in a truck project grant agreement that the local agency align the timing of its solicitation(s) with the solicitation(s) of other participating local agencies.
- Prior to opening a solicitation period, the local agency must submit a complete solicitation package, including the proposed equipment application form(s), program announcement(s), and information packet(s) to ARB staff for review and approval. Upon receipt of a complete solicitation package, ARB staff shall have a maximum of 8 business days to identify any necessary revisions, or the solicitation package shall be considered approved.

The documentation on the solicitation process shall include, but is not limited to, the following:

- Start and end dates for the equipment project application period.
- A list of materials in the information packet (see below).
- A solicitation schedule with milestones.

As part of the program announcement, the local agency shall make an information packet available to equipment owners who may be interested in applying for funding. This packet shall include the equipment project application, plus materials that describe all of the following:

- Application submittal information (how, where, by when, to whom).
- The Program and purpose for the solicitation.
- The equipment eligible for Program funding, including equipment project requirements and conditions (e.g., equipment inspections and any associated requirement for the equipment owner to bring equipment to a designated location, California operation, scrappage of old equipment, legally binding contract and contract terms, etc.).
- Information on what owners must do to maintain eligibility throughout the funding process.
- The application forms (all required information specified in the applicable Appendix), including disclosure language.
- Limits on available funding per piece of equipment.
- Provide information on where the applicant may obtain ~~T~~the equipment project evaluation and competitive ranking process. The local agency must inform equipment owners that they **may** request a reduced funding amount to improve the cost-effectiveness and competitiveness.
- A clear statement that locomotives and trucks funded by this Program may be

pre-ordered prior to contract execution at the equipment owner's risk, but can only be purchased once the existing equipment has been pre-inspected and the contract is signed between the equipment owner and the local agency.

- ~~Equipment application disclosure language, and a~~A clear statement for cargo handling equipment and harbor craft funding categories that new equipment funded by this Program can only be purchased or ordered once the existing equipment has been pre-inspected and the contract is signed between the equipment owner and local agency. ~~Locomotives may be pre-ordered prior to the execution of a contract.~~
- The payment process, including invoice payments and direct payments ~~to vendors~~, as applicable.
- The reporting requirements.
- Other information as required by the Supplemental Procedures (for ships at berth projects) including what activities that may begin prior to the execution of an equipment project contract. The Supplemental Procedures are available on the Program website.
- ~~Remedies for contract non-performance.~~
- ~~The ongoing equipment evaluation and auditing process.~~

4. Requirements for equipment projects where the local agency is also the equipment owner

For certain types of equipment projects, the local agency administering the grant from ARB may also be the owner of the equipment that is competing for funding to upgrade. For example, a port may be acting as a local agency under this Program and seeking funding as the equipment owner to install a grid-based shore power project. Any local agencies awarded grants from ARB that also want to be the equipment owner recipient of the funding shall comply with the additional requirements listed below, and any supplemental requirements identified by ARB staff, to reduce the inherent conflict of interest:

- Prior to opening a solicitation period, the local agency must submit to ARB staff (for review and approval) the proposed equipment application form(s), the solicitation/program announcement(s) and information packet(s) for applicants.
- Solicitation must require that the applications be sent in a sealed envelope.
- Sealed applications must be opened with ARB staff and the local agency present.
- Ranked list must be developed and approved in conjunction with ARB staff.
- The local agency must sign a contract with ARB to receive authorization to use those funds (this contract is in addition to the grant agreement that covers the local agency's grant administration responsibilities).

5. Evaluation and Goods Movement Online Database entry of equipment project applications

The local agency shall review equipment project applications for eligibility and content, including whether an application is submitted in good faith, credible, and in compliance with these Guidelines.

a) Review of equipment project applications

At a minimum, the local agency review of all equipment project applications shall include:

- Verification that the equipment and owner are eligible to participate in the Program.
- Verification that the proposed equipment project is consistent with these Guidelines.
- Determination that all data and information necessary to calculate benefits and costs consistent with approved ARB methods are included.

For truck projects, at a minimum, the local agency review of equipment projects shall also include:

- Verification of current ownership (copy of the title of the truck or registration) for any truck that will be scrapped or reused (not applicable to repower projects).
- Verification of California registration.
    - Eligible registration types include:
        - California base-plated registration, OR
        - California IRP, OR
        - Dual-plated registration (California based-plated/California IRP and Mexico only) for trucks carrying goods across the California-Mexico border, as they are required to be dual-plated.
    - Current registration.
    - Registration for the past 2 years.
        - Current year (1-12 months prior to application date) and prior year (13-24 months prior to application date).
        - California Department of Motor Vehicles (DMV) registration cards for the past 2 years or California DMV Vehicle Registration Information Record (DMV printout).
            - The DMV printout may be obtained by submitting a Request for Driver Record Information (INF 1125) form to the DMV.
            - The DMV printout must show registration in both the current year and prior year (as defined above) with a minimum of 6 months of total registration.
            - If the DMV printout shows registration in the current year of 8 months and no registration in the prior year, alternative documentation (insurance certificate or Biennial Inspection of Terminals inspection (BIT inspection)) may be used to show operation in the prior year.

- Verification of the original manufacturer's gross vehicle weight rating (GVWR).
  - If the GVWR is not readily available or is conflicting with the information listed on the equipment project application or approved ranked list, the local agency shall obtain the GVWR from the manufacturer or ARB using the VIN.
  - If allowed, the manufacturer's GVWR for a glider kit truck shall be determined using build documentation.
  - If these options fail to establish the GVWR, the local agency may determine the most likely GVWR (at time of original manufacture) based on the local agency inspector's experience and available corroborating information/ documentation.
- Verification of the vehicle miles traveled (VMT) in California for the past 2 years.
  - Odometer readings (required) at least 6 months apart including any of the following records or combination of records:
    - Pre-inspection reading.
    - Maintenance records.
    - Biennial Inspection of Terminals (BIT inspection).
    - International Fuel Tax Agreement (IFTA) records.
    - Alternate documentation, as approved by the local agency.
  - For concrete mixer trucks, dump trucks, bulk blower trucks, and other truck types specifically identified by ARB staff, the owner may provide the Power Take Off (PTO) hours in conjunction with VMT:
    - Documentation from the hour meter unit is required. Include information that verifies whether or not PTO hours are accumulated independently of VMT.
    - PTO hours will be converted to miles based on a factor of 20 miles for every hour. These converted miles may then be combined with VMT in the calculation of emission reductions and cost-effectiveness if the local agency determines PTO hours are accumulated independently of VMT.
    - Where PTO hours and VMT are not accumulated independently, the local agency may use either PTO hours or VMT.

b) Goods Movement Online Database entry of equipment project applications

After the initial review of the equipment project applications, the local agency shall enter or import eligible equipment project applications into the Goods Movement Online Database. The Database shall aid the local agency and ARB in reviewing, ranking, and tracking equipment projects.

6. Match funding for equipment projects

a) Carl Moyer program

Local air districts cannot combine funding from this Program and direct funding from the Carl Moyer program on the same equipment project (i.e., funds directly authorized under H&S §44091.1(a) and Public Resources Code §42889).

In response to air district requests, ARB staff has evaluated whether some "pass-through" vehicle registration fees that can be used in the Carl Moyer program may also be used for match funding under this Program. Under AB 923 (Chapter 707, Statutes of 2004), the $2 surcharge on the vehicle registration fee can be used for match funding of Proposition 1B projects, consistent with State law.

Program funds and the $2 surcharge may be combined on the same equipment project if all of the following conditions are met: (a) the equipment project meets both bond Program eligibility requirements and Carl Moyer program funding criteria; (b) the equipment project does not exceed the Carl Moyer program cost-effectiveness limit, with the project cost including both Program and AB 923 funds; and (c) the $2 surcharge funds are not counted as part of an air district's Carl Moyer program match requirement.

For the purpose of competitively ranking local agency and equipment projects under this Program, the calculation of reductions per State dollar invested must treat both bond Program monies and the $2 surcharge monies as applicable State funds since the surcharge monies would otherwise be used in the Carl Moyer program.

b) Motor vehicle registration fees (AB 2766)

Assembly Bill 2766 (AB 2766) (Motor vehicle registration fees; Chapter 1705, Statutes of 1990) provides for the collection of an additional $4 in motor vehicle registration fees to fund various air pollution efforts. For the purpose of this Program, AB 2766 funds can be used for match funding of Program projects and are not considered State funds.

c) Match funding from greenhouse gas reduction incentives, including AB 118

SB 88 directs ARB to consider projects that cut greenhouse gas emissions to support the State's greenhouse gas emission reduction goals. To encourage greater State funding for projects with significant greenhouse gas reductions, local agencies, and equipment owners can supplement Program funds with monies from other State sources intended to reduce greenhouse gases, including (but not limited to) the AB 118 Alternative and Renewable Fuel and Vehicle Technology Program administered by the California Energy Commission. Provided that toxic and criteria pollutant emission reductions are only credited to the Proposition 1B Program (not the other State funding source), such monies shall be excluded from the total applicable State funds used to determine the cost-effectiveness of a proposed project under this Program. Since reductions in greenhouse gases are not quantified as part of the benefit side of the cost-effectiveness calculation, State incentives to cut greenhouse gases can similarly be excluded from the cost side of this calculation.

<u>For zero-emission truck projects co-funded with AB 118 funds, criteria pollutant emission reductions beyond the 2010 engine standard may be credited to the ARB's AB 118: Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP). These funds may be included in the cost side of this calculation.</u>

7. Competitive ranking and selection of equipment projects

Local agencies shall enter or import equipment project application information into the Goods Movement Online Database to create a competitively ranked list of eligible equipment projects. This process will be applied to competing equipment projects under each solicitation and grant agreement. Should the Database not be available, the local agency shall create a competitively ranked list on an Excel spreadsheet using a template provided by ARB staff.

The following procedures for local agencies to rank and select equipment projects are based on the quantitative process ARB will use to competitively rank and select local agency projects. Chapter II.E.6. provides additional explanation of the elements of this process and Figure II.1 illustrates how the competitive process works.

The competitive ranking shall be quantitative based on multiple factors – emission reductions and a measure of cost-effectiveness that considers match funding. The calculation of emission reductions uses the Carl Moyer program protocol of weighting combustion PM emissions (essentially diesel PM) by a factor of 20 relative to other pollutants to account for the greater health impacts of PM per ton of emissions. This protocol helps target Program funding to the projects that will achieve the greatest reduction in health risk.

The local agency shall publish the ARB-approved list of competitively ranked projects on the agency's website and provide a link to ARB's Program website.

a) Emission reduction score

For each equipment project within a funding category, the local agency shall use the Goods Movement Online Database, or alternate means provided by ARB, to calculate the total pollutant-weighted emission reductions in California, over the project life.

Emission reductions = Reduction in NOx + (combustion PM x 20) emissions in California over the project life in pounds

The local agency shall list all equipment projects within the same funding category and eligible under the same local agency project grant agreement, in descending order of emission reductions, with the greatest emission reductions on top and the lowest emission reductions on the bottom. The local agency shall number or score each project starting at the bottom with a score of 1 and continuing consecutively to the top project. For example, if there are 8 project proposals, the one with the greatest emission reductions would receive a score of 8.

Emission Reduction Score = number from above evaluation

b) Cost-effectiveness score

For each equipment project within a funding category, the local agency staff shall use the Goods Movement Online Database, or alternate means provided by ARB, to calculate total pollutant-weighted emission reductions in pounds (as determined above), divided by the total applicable State funding proposed for the project. Total applicable State funding includes requested Program funds specific to that equipment project, plus any other State dollars, as applicable (see Chapter IV.A.6.).

Cost-effectiveness = weighted emission reductions (lbs)/total State $

The local agency shall list all equipment projects within the same funding category and eligible under the same local agency project grant agreement, in descending order of emission reductions per State dollar, with the highest number on top and the lowest number on the bottom. The local agency shall number or score each project starting at the bottom with a score of 1 and continuing consecutively to the top project. For example, with 8 equipment project proposals, the one with the greatest emission reductions per State dollar would receive a score of 8.

Cost-Effectiveness Score = number in above evaluation

c) Competitive ranking

The local agency shall add the Emission Reduction Score to the Cost-Effectiveness and Match Score to determine the final points for each equipment project. The agency shall rank equipment projects within the funding category covered by the grant agreement from highest points to lowest points to create the competitive ranking list.

Note: Eligible zero-emission truck projects utilizing AB 118 funds shall automatically be ranked above other competing equipment project options. Also, eligible projects to upgrade switcher locomotives shall automatically be ranked above other types of competing locomotive equipment project options, consistent with the statutory direction to give funding priority to switchers.

d) Ranked list approval process

The local agency must submit ranked lists to ARB staff for approval prior to selecting projects for funding or requesting project funds from ARB. The process for generating an approval of a ranked list is described below and may be revised by ARB staff as needed and available on the Program website:

- A local agency enters equipment project application information into the Goods Movement Online Database to create a preliminary competitively ranked list of eligible equipment projects. The local agency may also submit the information via an Excel spreadsheet which will be imported into the Database. Applications that are ineligible, incomplete, or withdrawn prior to the ranked list do not need to be entered into the Database. Only minimum information (applicant name, local agency tracking number, VIN, fleet size, and if project was ineligible, incomplete, or withdrawn) shall be entered into an Excel spreadsheet, or other means specified by ARB staff. The local agency shall keep this and related files for 3 years to be made available for audit review and to be provided, upon request, to ARB.
- ~~The local agency must submit to ARB for approval its internal verification process.~~
- After the local agency has completed its internal review of the submitted data and the preliminary ranked list, the agency notifies ARB staff (by e-mail) that the ranked list is ready for approval. ARB staff reviews the ranked list and if needed, requests additional clarification, corrections, and/or documentation to ensure information in the Database is credible. ARB staff identifies any issues with the ranked list via email to the local agency.
- ARB staff notifies the local agency when the ranked list has been approved and is available to be posted on the local agency's website.

e) Selection of projects for funding

The local agency shall use the ARB approved ranked list to select projects for funding. The local agency shall apply the available grant dollars (minus allowed administration funding) to the list of competitively ranked equipment projects within the funding category. The local agency shall award grant funds to the top project and continue down the competitive ranking list until the grant funds are exhausted. Projects with an increase in emissions or negative cost-effectiveness are not eligible for funding. ARB staff may identify a minimum cost-effectiveness to ensure that Program monies achieve the intended benefits. Any minimum cost-effectiveness requirement not currently included in the Guidelines will be available on the Program website.

The local agency shall maintain an equipment project backup list comprised of the projects on the competitive ranking list that did not receive funding. Equipment projects on this backup list are available for Program funding, in the order established on the competitive ranking list, if additional funds become available. Funds may become available when an equipment project selected for funding does not pass the pre-inspection, when an equipment owner voluntarily withdraws from the Program prior to execution of an equipment project contract, or for other reasons.

As funding becomes available, local agency staff shall make a reasonable effort to contact the equipment owner with the top unfunded equipment project on the competitive ranking list to: (a) determine if the owner is still interested in participating in the Program; and (b) obtain an updated signed equipment project application disclosure statement to verify that the equipment owner has not applied for Program funds elsewhere. If the local agency is unable to proceed with the top equipment project after a reasonable effort, the local agency may proceed with the next equipment project on the competitively ranked list.

f) Reinstating withdrawn or cancelled projects

Reinstatement of a withdrawn or cancelled project is at the local agency's discretion, subject to the availability of Program funds, and shall include, but is not limited to the following provisions:

- Local agency has a policy that provides opportunities for all similar applicants.
- The equipment owner's request for reinstatement shall be in writing.
- Only equipment projects on the ARB approved ranked list may be reinstated.
- No equipment project that received a funding commitment shall be displaced as a result of reinstating a withdrawn project.
- The equipment project and owner meet all Program eligibility requirements.

8. Compliance check

All projects in each source category may be subject to a compliance check.

For truck projects, ~~T~~the local agency shall ~~conduct~~ submit information for a compliance check on the old vehicle and the equipment owner for all truck replacement, repower, or retrofit projects proposed for funding prior to executing an equipment project contract to ensure both the equipment and owner are in compliance with all ARB regulations ~~do not have any outstanding air pollution-related equipment violations.~~ Potential non-compliance may include, but is not limited to the following:

- Outstanding ARB citation or violation.
- Pending ARB enforcement investigation.
- Failure to meet ARB regulatory requirements.

a) Compliance check results and implications for truck projects

If the compliance check indicates there is an outstanding ARB citation or violation that is a result of the improper use or maintenance of a compliant engine, the applicant has the ability to correct the violation and pay applicable fines prior to the execution of an equipment project contract. Such violations may include, but are not limited to the following:

- An engine control label (ECL) violation.
- An opacity violation.
- An idling violation.
- A smoke inspection violation.

If the compliance check indicates there is an outstanding ARB enforcement investigation, or an investigation is opened during the time prior to funding, ARB will determine whether the applicant may maintain eligibility.

If the compliance check indicates tampering, reporting of false data, or that any ARB regulation has been violated (other than correctable violations as described above), the applicant is no longer eligible for Program funds. The local agency shall inform the equipment owner in writing that the equipment project application has been disqualified for funding.

b) Compliance check process for truck projects

To submit the compliance check, the local agency ~~shall~~ may either enter ~~the following required~~ requested information for each ~~truck~~ project into the Goods Movement Online Database, or submit this information to ARB via an external compliance check spreadsheet. This information may include, but is not limited to the following:

- Registered equipment owner name.
- Company/business name.
- Vehicle identification number (VIN).
- Vehicle license plate number.
- Unique ARB identifier (e.g., equipment owner's identification number from ARB's online Truck Regulation Upload, Compliance, and Reporting System (TRUCRS)).

The local agency may also enter the following optional information into the Database:

- California Highway Patrol number (CA Number).
- U.S. Department of Transportation number.
- Interstate Commerce Commission number.

Due to the large number of ~~vehicles~~ projects that ~~could~~ may require compliance checks, local agencies are encouraged to submit data as soon as possible after receipt of the application.

ARB Program staff shall work with ARB's Enforcement Division and other ARB staff to obtain the information and display the results of the compliance check in the Database. ARB staff will endeavor to provide the results to the local agency within 10 business days, based on the receipt of complete and accurate information. The turnaround time may increase depending upon work volume and available ARB staff resources.

Local agencies may sign equipment project contracts prior to completion of ARB's fleet compliance checks for the Statewide Truck and Bus Rule. The contracts must contain appropriate language that states funding for each project is contingent upon successful completion of the compliance check which: (1) verifies fleet compliance with rule requirements; and (2) states that the project is still eligible for funding.

For ~~FY2007-08 Program~~ Year 1 funds, if the compliance check indicates there is an outstanding violation prior to the application date, the equipment project application shall be disqualified unless the violation is for an engine label. The local agency shall inform the equipment owner in writing that the equipment project application has been disqualified for funding, and that the owner must correct the violation and pay any applicable fines.

For ~~other Program~~ Year 2 and Year 3 funds, if the compliance check indicates there is an outstanding violation on any vehicle within an owner's fleet, the local agency may offer all affected equipment owners the opportunity to retain grant eligibility by correcting the violation and paying any fines prior to execution of the contract(s) between the local agency and equipment owner. If the local agency has notified the equipment owner of the violation, and the equipment owner does not correct the violation and pay applicable fines in a timely manner, the local agency shall inform the equipment owner in writing that the equipment project application has been disqualified for funding.

For Year 4 and later funds, if the compliance check indicates there is an outstanding **correctable** violation (as described in Chapter IV.A.8.a.) on any vehicle within an owner's fleet, the local agency may offer all affected equipment owners the opportunity to retain grant eligibility by correcting the violation and paying any fines prior to execution of the contract(s) between the local agency and equipment owner. If the local agency has notified the equipment owner of the correctable violation, and the equipment owner does not correct the violation and pay applicable fines in a timely manner, the local agency shall inform the equipment owner in writing that the equipment project application has been disqualified for funding. If the violation is for ARB regulations, the local agency shall inform the equipment owner in writing that the equipment project application has been disqualified for funding.

9. Notifications to equipment owners

The local agency shall notify equipment project applicants of the status of their applications. Notifications shall be in writing, and occur within a reasonable time after the end of the solicitation period.

At a minimum, written notifications shall include the following:

- A clear statement whether or not the equipment project is eligible for Program funds.
- If the equipment project is eligible, the notification shall include a clear statement indicating whether the equipment project was selected for funding or placed on the backup list.
- If the equipment project is selected for funding, the notification shall include:
    - Total Program funding amount for equipment project.
    - Information and deadlines for scheduling a pre-inspection.
    - Language indicating Program funding is contingent on passing the equipment pre-inspection and compliance checks.
    - Information regarding what the equipment owner must do to maintain eligibility.
    - Information and deadlines for executing equipment project contracts, applying for direct payments to vendors (if applicable), post-inspection requirements, deadlines to complete the project, and the process for obtaining Program funds through invoice payments.
- If the equipment project is placed on the backup list, the notification shall include information pertaining to the potential for future funding of the equipment project.
- If the equipment project is not being considered for Program funding, the notification shall include information about the equipment owner's ability to apply for other incentive funding opportunities, and the ability to participate in Program funding in future years.

10. Equipment project pre-inspections

The local agency shall conduct and document equipment project pre-inspections after the local agency has identified equipment projects for funding under this Program. Pre-inspection information and results shall be entered into the Goods Movement Online Database. Pre-inspections are not required if the existing equipment was previously funded by the Program within 2 years of the equipment project application date. All items shall remain in the project files and be made available to ARB upon request. At a minimum, the local agency shall:

- Ensure pre-inspections are conducted by local agency equipment inspectors, their designated contractors (i.e., dealerships), or staff from another local agency with an executed Program grant agreement and experience administering Program grants for that specific source category.
- Initiate and maintain a contract or MOU with any contractor pre-inspecting equipment to ensure Program pre-inspection requirements are met.
- Only designate a contractor for one of the two required equipment project inspections (pre-inspection or post-inspection), not both.
- Not restrict equipment projects to equipment sold by a truck dealer or retrofit vendor with a contract or MOU to do pre-inspections.

~~Pre-inspections at the local agency's discretion, may occur prior to or after the execution of an equipment project contract and must be conducted by local agency equipment inspectors or their designated contractors which may include truck dealerships. The local agency shall initiate and maintain a contract or MOU with any truck dealership pre-inspecting equipment to ensure Program pre-inspection requirements are met. A local agency shall not restrict equipment projects to equipment sold by a truck dealer or retrofit vendor with a contractor MOU to do pre-inspections.~~

The pre-inspection for each source category shall, at a minimum, include:

- Collection of the owner's name, address, and telephone number.
- Identification of the location of the engine (business, ship berth, or truck facility).
- Collection of the serial number of the baseline engine and any additional information necessary to assist in the verification of the baseline engine application information. For engines without a visible and legible serial number, the local agency inspector must stamp or tag the engine block with the Program equipment project number.
- Collection of baseline information on ship activity at the berth, or truck activity at the truck stop or distribution center.
- Photographic, digital documentation for the project file of each piece of equipment being pre-inspected. The photographic documentation shall include:
    - The serial number of the engine (if legible) or Program equipment project number.
    - License plates or other distinguishing identification that is visible on the equipment.
    - A photograph that captures a full view of the equipment being inspected (e.g., the entire truck, vessel, locomotive, etc.).

- Description of the local agency's method for cataloging, referencing, storing, and easily retrieving project-specific photos.
- Verification by meter reading of the equipment usage (hours or miles), and that the usage reported in the equipment project application is reasonable given the usage meter reading.
- Verification that the engine is operational (with a start-up) and is working as described in the equipment project application (document function and use).
- Verification that engines subject to the software upgrades for diesel truck retrofit projects (i.e., chip reflash) have completed the upgrade.
- Verification that a functioning diesel particulate filter or other retrofit device is installed if listed on the application, listed on the approved ranked list, or required by regulation.
- Verification of project eligibility and the information gathered during the pre-inspection is consistent with information listed on the equipment project application or approved ranked list (including, but not limited to, the engine model year, activity/mileage, registration, installation of a functioning retrofit device, and for truck projects, the original manufacturer's gross vehicle weight rating (GVWR)).

If the contract is executed prior to pre-inspection, the equipment owner may not order the new equipment until the existing equipment has passed pre-inspection, except for truck and locomotive equipment projects, and ships at berth projects, as specified in the Supplemental Procedures available on the Program website.

11. Equipment project contracts

The local agency shall obligate funds for each equipment project as described in these Guidelines and within the obligation deadlines as described in Chapter IV.B.1. These funding commitments shall become legally enforceable only through executed equipment project contracts between the local agency and equipment owner. The local agency shall obtain ARB approval of contract templates before executing contracts with equipment owners.

~~For FY2007-08 funds, all equipment project contracts shall be executed within 24 months of the execution of the grant agreement between ARB and the local agency, extended to account for any time that the local agency was prohibited by ARB from implementing the grant.~~

~~For FY2008-09 and later funds, local agencies shall obligate Program funds no later than 18 months from the date of the executed grant agreement between ARB and the local agency, or no later than 18 months from the date ARB issues a Start Letter to the local agency, whichever comes later.~~

Local agency staff shall prepare and submit for review and signature two copies of the contract for Program funding to be signed by the equipment owner. After an equipment owner and the local agency sign two copies of the contract agreement, the local agency shall retain one fully executed copy for its files, and return one fully executed copy to the equipment owner. Following execution of an equipment project contract, local agency staff shall enter or import the equipment project contract information into the Goods Movement Online Database. All items must remain in the project files and be available to ARB upon request.

At a minimum, an equipment project contract shall contain the following provisions:

a) Standard contract provisions

- Contract number—unique tracking number provided by local agency for each contract.
- Effective date.
- Term of contract (project completion time plus equipment project life).
- Equipment owner contact information.
- Indemnification—equipment owner agrees to indemnify and hold harmless ARB and the local agency for any liability arising out of the performance by the equipment owner.
- Severability—remaining provisions of a contract continue in effect even if a court holds a specific provision invalid.
- Force majeure—ARB, local agency, and equipment owner are not liable for delay or failure in performance resulting from acts beyond their control.
- Contract amendments—amendments shall only occur by mutual agreement in writing and signed by all parties.

b) General Program provisions

- Application—incorporate by reference the original equipment owner application.
- Reporting requirements—equipment owner is responsible for submitting annual reports to the local agency, unless otherwise noted in these Guidelines. The local agency contract with equipment owner must specify reporting requirements listed in the applicable Appendix.
- Ongoing evaluations and audits—equipment owner agrees to allow ongoing evaluations and audits of equipment and documentation by the local agency, ARB, or their designated representative(s).
- Records access requirements—equipment owner agrees to allow the local agency, ARB, or their designated representative(s) access to evaluate or audit Program records.
- Recordkeeping requirements—equipment owner agrees to retain all records pertaining to the Program e.g., invoices, contracts, and correspondence, for at least 2 years after equipment project life ends or 3 years after final payment, whichever is later.

- Enforcement—provisions authorizing the local agency to inspect equipment projects to enforce contract terms.
- Equipment project contract non-performance provisions (see Chapter VI.~~H~~K.) includes, but is not limited to:
  - Failure to meet the terms and conditions of an executed equipment project contract.
  - Equipment/engine is non-operational, malfunctioning, or damaged.
  - Failure to operate or maintain equipment in accordance with manufacturer's recommendations.
  - Intentional destruction of equipment.
  - Failure to meet established deadlines for equipment project completion.
  - Failure to allow for an electronic monitoring device, if required, or tampering with an installed device or data.
  - Misuse of direct payments to vendors provisions.
  - Insufficient, incomplete, or faulty equipment project documentation.
  - Failure to provide required documentation or reports in a timely manner.
- Remedies for non-performance include, but are not limited to:
  - Recovery of all or a portion of Program funds.
  - Other fiscal penalties on equipment owners based on the severity of the non-performance.
  - Cancellation of the contract.
  - A ban on the equipment owner's ability to participate in future State incentive programs.
  - Prohibiting a specific piece of equipment from participating in another State incentive program.
- Contract reinstatement requirements (see Chapter VI.G.).
- Contract transfer and buy-out provisions (see Chapters VI.~~F~~I. through VI.~~H~~J.).
- Lease-to-own—allowance for an equipment owner with a lease-to-own contract to elect to change to a direct purchase contract.
- Direct payments to ~~dealers or manufacturers~~ vendors or financing entities—allowance for local agency payments to go directly to vendors, including vehicle or equipment dealers or manufacturers, or third party financing entities (banks for financing companies) ~~in the case of direct payments to vendors~~. Checks may be made payable to both parties: equipment owner and dealer, ~~or~~ manufacturer, or financing entities, if applicable. Chapter IV.B.2.d. describes the requirements for direct payment to vendors or financing entities.
- Independent contractor—equipment owner is an independent contractor and none of equipment owner's agents shall be construed as agents or employees of ARB or the local agency.
- Equipment maintenance—equipment owner is responsible for maintaining Program-funded engines or equipment in good operating condition and according to manufacturer's recommendations, and as described in these Guidelines.
- Time is of the essence—time is of the essence in the performance of all contracts.
- Program acknowledgment—equipment owner agrees to acknowledge the Program as a funding source in any related media events or other publicity material.

c) Source category-specific elements

- Equipment project description.
- Total cost for the equipment project.
- Project cost breakdown (including technology/equipment purchase, labor for retrofit/installation, etc.).
- Eligible costs—costs directly tied to the purchase of ARB-approved equipment projects.
- Total Program funds for the project.
- Non-State match funds and source(s) of those funds—includes cash, in-kind, or other sources.
- Ineligible costs—costs not directly tied to the purchase of ARB-approved equipment projects, if applicable.
- Project performance benchmarks—the expected activity (e.g., estimated annual mileage or engine hours from application) and emission reductions (estimated NOx and PM reductions over the life of the project from the posted ranked list) from the new equipment.
- Project inspections—equipment owner agrees to pre-inspection by the local agency (or their designee) of old equipment ~~prior to or after the execution of a contract,~~ and post-inspection of the new/upgraded equipment. ~~prior to final payment. If the contract is signed before pre-inspection, the equipment owner cannot order the new equipment until the existing equipment has passed pre-inspection.~~
- Project schedule—timeframe required to complete equipment project including major milestones.
- Schedule to expend funds—estimated schedule for local agency to expend Program funds to the equipment owner.
- Request for payment—steps required for equipment owners to request expenditure of Program funds, including the prohibition of payment for equipment that was ordered or purchased prior it to contract execution (as applicable) and direct payments to vendors or financing entities, ~~if~~ as applicable (see Chapter IV.B.2.).
- Equipment warranty/insurance—equipment owner is responsible for securing warranty and maintaining insurance on the new equipment sufficient to repay the State's investment in case of major damage.
- Electronic monitoring devices—provisions requiring equipment owners to agree to the installation and use of an electronic monitoring device at any time during the contract term. For locomotives and harbor craft utilizing the 90 percent California-~~only~~ operation option, the equipment owner is responsible for purchasing, installing, and maintaining a device that can produce the electronic reports required by ARB, as documented on the Program website.

- Project acknowledgement—if the applicant (equipment owner) of a truck electrification infrastructure or grid-based shore power project does not own the site where the equipment will be installed, the equipment project contract shall address the project acknowledgement requirements listed in Appendix A, Section B.2.b. or Appendix C, Section C.3.a. by one of the following methods:
    - Inclusion of the project acknowledgement requirements and site owner signature as a third party to the contract.
    - Incorporation by attachment of a separate project acknowledgement document from the site owner (e.g., a signed letter).
    - Requiring the equipment owner to enter into a contract or lease with the site owner which meets the project acknowledgement requirements. Require the executed contract or lease with the site owner to be sent to the local agency for review when available and in a timely manner.
- Ships at berth projects—for Year 4 and later funded projects, the equipment project contracts shall hold both the equipment owner and the shipping line legally liable for complying with the contract and Program requirements. The equipment project contract may allow certain provisions to apply solely to the shipping line (e.g., the number of ship visits or the number of hours). Refer to the Supplemental Procedures available on the Program website for additional equipment project contract requirements.

12. Tax reporting

The local agency shall comply with all State and federal tax reporting requirements associated with the payment of Program funds to equipment owners. This may include requiring the submittal of tax information using federal tax Form W-9, and issuing a federal Form 1099 to the equipment owner receiving grant funds. The local agency shall also report the applicable tax information to the California Franchise Tax Board and federal Internal Revenue Service.

13. Provisions for lease-to-own programs

The local agency projects may use a lease-to-own program(s) for truck replacement projects. ARB staff may revise the specific requirements of this section as needed and post on the Program website.

a) General requirements

Lease-to-own programs shall comply with the following minimum requirements:

- The equipment project application must be signed and submitted by the owner of the old truck (applicant), and must include information on the old truck to be replaced, the new replacement truck, and the proposed lessee.
- The applicant must be the legal owner of the old truck at the time of application and must participate in the lease-to-own program as either the lessor or lessee.

- Equipment project applications may be amended to change the applicant's participation in a lease-to-own program, or change the lessor if approved by the local agency. All amendments must be completed prior to contract execution.
- Grant funds shall only be used to offset the capital cost of the truck and shall reduce the principal owed by the lessee to purchase the truck. The lessor shall not impose a charge on the lessee for any portion of the Program funds as a component of the lease payments. The lessor may set a lease payment schedule that recoups his or her out-of-pocket investment to purchase the new truck and a reasonable rate of interest over the term of the lease. Equipment project funds shall not be applied toward administration costs.
- As a remedy for the non-performance of a lessee under the equipment project contract, the lessor, with local agency approval, may transfer the truck to a new lessee, so long as the new lessee agrees to sign an equipment project contract under the same provisions, for the remaining contract term.
- A truck project participating in a lease-to-own program shall be subject to the same Program requirements as any other truck competing for funding under that local agency project – they must compete against all other truck projects within that funding category and trade corridor.
- Prior to executing contracts for the lease-to-own program(s), the local agency must submit program information and sample contracts to ARB staff for review and approval. Deliverables for approval include:
    - Sample equipment project contract(s) the local agency will execute with the lessor, lessee, and/or administrative entities participating in the Program.
    - Sample lease rider (see Chapter IV.A.13.c.) that will be executed by lessor and lessee.
- Other information specified by ARB staff and available on the Program website.

b) Legal structure provisions

- Equipment project contracts shall hold both the lessor and lessee legally liable (i.e., jointly and severally) for complying with the contract and Program requirements. There are multiple ways for the local agency to implement a lease-to-own program that ensures that the lessor and lessee are jointly and severally liable. Examples are shown below:
    - A local agency or an approved administrator executes a joint contract with the lessor and each lessee which includes all Program requirements. The equipment project contract may allow certain provisions to apply solely to the lessor (e.g., financial requirements) or lessee (e.g., operational requirements), so long as the local agency maintains the ability to enforce all remedies for non-performance under the contract(s), including the recovery of funds or repossession of the truck, if necessary.

- A local agency or an approved administrator may also establish separate legally binding agreements with the lessor and the lessee, or they may execute a contract with all Program requirements with a lessor and the lessor executes a lease agreement with each lessee. Program requirements can be distributed between the lessor and lessee. Both agreements must specify the ability of the local agency and lessor to enforce all remedies for any lessee's non-performance under an equipment project contract.

- See Chapter VI.~~H~~K. for equipment project non-performance provisions.

c) Lease agreement provisions

- Prior to executing a lease agreement with the lessee, the lessor shall ~~Lessor must~~ disclose in writing the following terms and conditions (signed or initialed by the lessee and attached to the lease agreement):~~information in writing to the lessee prior to executing a lease agreement:~~
  - Cost of the vehicle (total cost lessor paid for the vehicle less the amount of the grant).
  - Amount due at lease signing with an itemization of the charges.
  - Interest rate, monthly payment, and number of payments.
  - A schedule of potential late fees, penalties, mileage charges, or other items that can be charged to the lessee.
  - Residual or buyout amount the lessee will be required to pay at the end of the lease term in order to take ownership of the truck.
  - Total cost to lessee to take ownership at the end of the lease (total of fees, charges, monthly payments, and residual or buyout amount).
- If the local agency does not execute a contract with the lessee, the local agency shall require the lessor to incorporate the following requirements in a lease rider.
  - Statement that if any provision of the lease agreement conflicts with the terms of the lease rider, the provisions of the lease rider shall govern.
  - Contract terms that provide for the lessee to assume ownership of the Program-funded truck at the end of the lease period.
  - Other operational requirements of the Program, as identified by ARB staff and available on the Program website.

14. Equipment project scrap requirements

The local agency shall ensure that old equipment is scrapped (permanently removed from service) and associated materials disposed of in an environmentally acceptable manner, in accordance with these Guidelines and any applicable federal, State, or local laws, regulations, or requirements.

Scrapping operations and material disposal applies to the following:

- Truck engine repowers and truck replacement projects.
- Harbor craft engine repowers and vessel replacement projects.
- Locomotive engine repowers and new replacement projects.
- Cargo handling equipment ~~repower and~~ replacement projects.

Local agencies shall be responsible for implementing procedures for collecting all necessary information prior to scrap/disposal activities (e.g., during the pre-inspection). All information collected and recorded must be readily accessible to verify that scrap and disposal procedures were conducted for the appropriate engine, vehicle, vessel, or locomotive. Documentation shall be available to ARB or its designee to support ongoing Program evaluations or audits as necessary.

The following procedures must be implemented for all repower and replacement projects:

- Prior to destruction, old equipment must be in operable working condition and legal for use in California, as documented in the equipment pre-inspection provisions of these Guidelines.
- The old equipment engine block (for repower projects) or vehicle/vessel/locomotive, including the frame, diesel particulate filter, and engine block (for replacement projects) shall be physically destroyed in such a manner to eliminate the possibility of future operation. Engine blocks shall be punctured and the vehicle, vessel, or locomotive frame structure shall be dismantled, cut through, and/or demolished to render the equipment useless and to prevent future use. Diesel particulate filters may be swapped or re-designated if allowed under ARB's Verification Procedure for In-use Strategies to Control Emissions from Diesel Engines.
- Licensed dismantlers are required to enter into an agreement with the local agency to qualify for participation. Dismantlers are required to be licensed by the ~~Department of Motor Vehicles (~~DMV) (for auto-dismantlers), and also have a valid California Environmental Protection Agency (Cal/EPA) Hazardous Materials Generators Permit. In addition, the dismantler must ensure compliance with any federal, State, and local material disposal requirements, regulations, permits, or requirements.
- Funding is not available for any salvage or material disposal costs, including hazardous waste abatement fees, labor costs, fines, permits, or other charges resulting from destruction or disposal.
- All equipment to be scrapped must have a complete, visible, and legible serial number or a stamp of the Program equipment project number applied at the time of pre-inspection by the local agency or its designee.
- The local agency or its designee must obtain digital documentation to ensure the engine identified in the equipment contract and the pre-inspection is the one that is to be scrapped. This documentation includes specific photos to be taken before the engine is destroyed, as well as photos after the engine is destroyed as per the scrappage tables in Appendices A, B, D, ~~and~~ E, and F.

The destruction of any engine without a verifiable serial number or Program equipment project number stamped on the equipment at the time of the equipment pre-inspection does not fulfill the scrappage requirement under this Program.

The local agency must ensure the additional requirements for each piece of equipment are undertaken as per the scrappage tables in Appendices A, B, D, ~~and E~~F.

15. Reuse of trucks/limited alternative to scrappage for trucks

ARB may require or allow the local agency to make existing trucks being replaced under this Program available for limited reuse under specific programs approved by ARB. Trucks that are selected for reuse will not be subject to the scrappage requirements. Trucks that are not selected for reuse, and the older trucks being replaced by reused trucks, must be scrapped (see Appendix A). The ARB Executive Officer or his or her designee may approve truck reuse proposals that meet all of these criteria:

- Deliver an equivalent or greater air quality benefit in California (compared to scrappage of the middle-aged truck).
- Require any truck reused in California to be retrofit with a PM filter to ensure a localized health benefit.
- Require any truck reused outside of California to be prevented from re-entering the State.
- Are consistent with the principles and goals of this Program.
- Do not increase Program cost and do not substantially increase the Program administration workload.

ARB staff shall notify local agencies implementing truck projects of any new requirements to implement this provision, including reporting on the number of trucks made available for reuse as part of the semi-annual report.

16. Equipment project post-inspections

The local agency shall conduct and document equipment project post-inspections on all Program-funded equipment projects. Post-inspection information and results shall be entered into the Goods Movement Online Database. All items shall remain in the project files and be made available to ARB upon request. At a minimum, the local agency shall:

- Conduct a post-inspection after equipment project contract execution and before final Program payments are made by the local agency to the equipment owner.
- Ensure post-inspections are conducted by local agency equipment inspectors, their designated contractors (i.e., dealerships), or staff from another local agency with an executed Program grant agreement and experience administering Program grants for that specific source category.
- Initiate and maintain a contract or MOU with any contractor post-inspecting equipment to ensure Program post-inspection requirements are met.

- Only designate a contractor for one of the two required equipment project inspections (pre-inspection or post-inspection), not both.
- Not restrict equipment projects to equipment sold by a truck dealer or retrofit vendor with a contract or MOU to do post-inspections.

The final payment of Program funds held in retention shall be disbursed upon the completion of the post-inspection and as described in Chapter IV.B.2.e. For ships at berth grid-based power projects only, early reimbursement of up to 80 percent of eligible project costs may occur prior to post-inspection and as described in Chapter IV.B.2.e.

~~The post-inspection shall occur before final grant funding payments are made by the local agency to the equipment owner, and after the local agency has a valid invoice provided by the equipment owner.~~

Post-inspections for all equipment projects shall include, but are not limited to, the following requirements:

- Collection of the equipment owner's name, mailing address, and telephone number.
- Verification of equipment application information with new equipment to ensure the new equipment is consistent with the equipment described in the equipment application.
- Documentation of new equipment identifiers and specifications (e.g., VIN for new trucks, serial numbers for new engines, etc.).
- Digital photographic documentation of the equipment that is being post-inspected for the project file. This documentation shall include:
    - A photograph of the serial number of the engine.
    - A photograph of the license plate or other distinguishing identification that is visible on the equipment.
    - A photograph that captures the full piece of equipment (i.e., the entire truck, vessel, locomotive, etc.) that is being inspected.
- Methods for cataloging, referencing, storing, and easily retrieving specific equipment project documentation and photographs.
- Visual witness and verification that the vehicle/engine/equipment is operational as stated in the contract. The inspector must visually witness and verify all engine start ups and that all mobile equipment projects are operating properly.
- Verification of the destruction of the old/replaced equipment (engine, vehicle, vessel, or locomotive), where applicable. The inspector must be present to personally verify engine removal or must be provided documentation and photographic evidence of the equipment before and after the engine destruction for these engines.

In addition to the general post-inspection requirements above, Appendices A-E provide additional post-inspection requirements for each source category and equipment project option, as applicable.

17. Local agency requests to ARB for grant funds

The local agency may request grant funds from ARB by submitting a valid Grant Expenditure Request signed by an authorized local agency representative acting under a fully executed grant agreement. See Chapter II.F.2. for ARB's expenditure requirements and provisions.

18. Administration of Program funds

The local agency shall be held responsible for the administration of Program funds beginning immediately after receipt of these funds from ARB.

The local agency shall maintain Program funds in an account separate from all other funds administered by the local agency. It is the intent of Board that the Program funds shall not be placed in an account that puts the funding at financial risk. The local agency shall accept all financial risk, including losses from interest bearing accounts, and replace any loss of Program funds principal due to investment choice.

19. Local agency non-performance provisions

The local agency shall be held responsible for the implementation of the local agency project. See Chapter II.F.7. for local agency non-performance provisions and requirements.

B. Obligations, Expenditures, and Earned Interest

H&S §39626.5(b) requires the local agency to award the funds via contracts with equipment owners within 2 years of ARB allocating funds to the agency pursuant to a grant agreement. The statute also requires the local agency to liquidate funds within 4 years of the date of the award of the contract between the agency and the equipment owner. The funds revert to the California Ports Infrastructure, Security, and Air Quality Improvement Account if the statutory timeframes are not met. ARB staff may provide direction to local agencies regarding how this statute shall be applied in situations where the local agencies are expressly prohibited from implementing their grant agreements for a period of time due to suspension of the State's bond programs.

ARB staff may extend or shorten the obligation and expenditure deadlines from those described below to allow for factors which may affect the project's implementation schedule (i.e., upcoming regulatory deadlines or a delay in receiving Program funds). Extensions shall not exceed statutory deadlines. For Year 4 locomotive projects, the ARB Executive Officer or his or her designee may extend a local agency's obligation and/or expenditure deadline, as indicated below.

1. Local agency obligation of funds to equipment owners

For ~~FY2007-08~~Year 1 funds only, local agencies shall obligate Program funds via executed equipment project contracts no later than 24 months from the date of the executed grant agreement between ARB and the local agency, excluding the period of time that the local agency was prohibited from implementing the grant.

For ~~FY2008-09~~Year 2 and later funds, local agencies shall obligate Program funds via executed equipment project contracts no later than 18 months from the date of the executed grant agreement between ARB and the local agency, or no later than 18 months from the date ARB issues a Start Letter to the local agency, whichever comes later.

For Year 4 locomotive projects, the ARB Executive Officer or his or her designee may extend a local agency's obligation deadline for up to an additional 6 months, in the case of a manufacturer delay for a new engine or technology that meets U.S. EPA Tier 4 or lower emission standards (1.30 grams per brake horsepower-hour (g/bhp-hr) or lower NOx and 0.03 g/bhp-hr or lower PM). The local agency may submit to ARB a written request to extend the obligation deadline if they have determined the results of the Tier 4 field demonstrations inhibit the equipment owner's interest in eligible equipment projects. ARB staff shall review the request and issue a finding. If the finding supports the request for an extension, ARB shall provide an approval letter to the local agency.

2. Local agency expenditures on equipment projects

a) Expenditure deadlines for equipment projects

Local agencies shall comply with the following deadlines to liquidate Program funds. These expenditure deadlines represent the maximum time allowed from the equipment project contract execution date to the expenditure of Program funds to complete and close out an equipment project:

- 18 months to verify project completion/close out payment for truck retrofit, repower, replacement, and three-way transaction projects, and cargo handling equipment projects.
- 2 years to verify project completion/close out payment for locomotive projects, non-grid-based shore power projects, and projects to install a locomotive or ship emissions capture and control system. For Year 4 locomotive projects, the ARB Executive Officer or his or her designee may extend a local agency's expenditure deadline for up to an additional 12 months, in the case of a manufacturer delay for a new engine or technology that meets U.S. EPA Tier 4 or lower emission standards. The local agency may submit to ARB a written request to extend the expenditure deadline if they have determined an equipment owner would be unable to meet the project completion deadline due to Tier 4 locomotive manufacturing delays. ARB staff shall review the request and issue a finding. If the finding supports the request for an extension, ARB shall provide an approval letter to the local agency.

- 3 years to verify project completion, obtain at least 1 year of data on actual use, and close out payment for truck ~~stop or distribution center~~ electrification infrastructure projects.
- 4 years to verify project completion/close out payment for harbor craft projects and grid-based shore power projects.

No expenditures shall be approved if the engine, piece of equipment, or vehicle becomes operational after the operational deadline(s) listed in the grant agreement covering the equipment project contract.

b) Equipment project purchase restrictions

Except in the case of locomotives, ships at berth grid-based power, and truck projects, local agencies shall not reimburse equipment project applicants for orders or any payments on a new engine, piece of equipment, ~~or~~ vehicle, infrastructure, or other eligible costs that take place prior to local agency approval of the project ~~through contract execution~~.

Some ships at berth grid-based power costs may remain eligible for reimbursement if ordered, installed, or paid for prior to contract execution. The Supplemental Procedures available on the Program website provides information on eligible and ineligible expenses.

Replacement truck projects may remain eligible for reimbursement if ordered after the ARB-approved ranked list was posted on the administering local agency's website, providing the replacement truck was not paid for prior to contract execution.

Dealers and equipment owners ordering engines, equipment, or vehicles prior to contract execution assume all financial risk, and are in no way assured ~~grant~~ Program funds.

An equipment owner may not receive or place into operation replacement engines, equipment, or vehicles, nor may work begin on a repower or retrofit project or a project to install electrical infrastructure, until the project contract is fully executed, unless permitted within these Guidelines or the Supplemental Procedures available on the Program website.

Equipment owners shall not request or receive payments for an engine, piece of equipment, or vehicle that has become operational after the operational deadline(s) listed in the equipment project contract.

c) *Invoice payments (reimbursements)*

With the exception of approved direct payments to vendors and financing entities as described in Chapter IV.B.2.eA.11. and early reimbursement as described in Chapter IV.B.2.e., local agencies shall only expend Program funds through invoice payments. Invoice payments provide Program funding to equipment owners on a reimbursement basis.

Reimbursement to equipment owners cannot exceed the amount directly paid by the equipment owner.

~~After receiving a satisfactory post-inspection from the local agency on a completed equipment project, the equipment owner shall complete and submit an itemized~~ Reimbursement may only occur after the equipment has passed a post-inspection and the local agency has received from the equipment owner a valid invoice for the fully operational new engine, vehicle, or piece of equipment, except for described in Chapter IV.B.2.e. for ships at berth grid-based power projects ~~to the local agency for reimbursement~~. However, for truck replacement projects, the local agency may reimburse the equipment owner upon submission of a valid invoice once the following requirements have been met:

- Equipment owner or dealer must deliver the old truck(s) to a licensed dismantler ~~within~~ up to 30 ~~calendar~~ days ~~of~~ after receiving the new fully operational equipment.
- Local agency must verify with the licensed dismantler that the old equipment has been delivered and is in custody of the dismantler.

An invoice shall be itemized to include enough detail to ensure that the local agency provides reimbursement only for eligible project costs, yet be clear and concise enough to be understandable. The local agency shall review the itemized invoice and only pay for eligible expenses up to the funding caps established by these Guidelines and the grant agreement.

Equipment owners shall not request or receive payments for engines, vehicles, equipment, or electric infrastructure that are non-operational, taxes, consulting services, license, permit fees, registration, insurance, or any other costs not eligible for Program funds. Only ships at berth grid-based power projects shall be eligible for early reimbursement prior to the equipment being placed into operation, as described in Chapter IV.B.2.e.

Charges for equipment and parts on engine repower projects are only eligible for funding if they are required to ensure the effective installation and functioning of the new engine and achieve the expected emissions performance, but are not part of typical vehicle or equipment maintenance or repair. Examples of ineligible repower costs include, but are not limited to: tires, axles, paint, brakes, and mufflers.

Most labor expenses are not eligible for payment with Program funds; the exceptions are: labor to install a diesel PM filter on a truck, labor to make necessary vessel modifications and install the new engine in a harbor craft, and labor to install the electrical infrastructure to supply a ship berth or truck pedestal. Whether reimbursable with Program funds or not, labor expenses shall be included in the itemized invoice with the detailed number of hours charged and the hourly wage.

Equipment owners may submit a single, itemized invoice for multiple, completed equipment projects under this Program. The invoice shall itemize the charges for each equipment project.

Invoice payments may be made directly to the equipment or engine dealer or distributor only if such payment arrangements are specified in the equipment project contract.

The local agency shall maintain copies of all invoices and documentation of payment in the equipment project file.

d) Direct payment ~~to vendor~~

Local agencies ~~shall~~ may expend Program funds through invoice payments (described in Chapter IV.2.c.~~above~~) or according to the direct payment ~~to vendor~~ option described in this section. The direct payment ~~to vendor~~ option is only available ~~to~~ for truck retrofit and replacement equipment projects, and harbor craft repower and replacement equipment projects. Direct payments may be made to vendors (vehicle or equipment dealers or manufacturers) or third party financing entities (banks or financing companies). The following requirements apply:

- Funds paid to the vendor shall be used only towards the purchase of the funded equipment.
- Funds paid to the financing entity shall be used only to reduce the principal amount of a loan secured against the funded equipment.

Local agencies shall approve ~~all~~ direct payment ~~to vendor~~ requests ~~as part of their contract process~~ prior to payment. Direct payment terms shall be incorporated in the legally binding equipment project contract between the local agency and equipment owner. The equipment project contract shall include terms specifying arrangements for the local agency payments to go directly (or jointly) to a vendor or financing entity~~the engine, truck, or retrofit dealer or manufacturer~~.

The local agency may issue a check made payable to two parties, the equipment owner and the dealer, ~~or~~ manufacturer, or financing entity once the following requirements are met:

- The local agency has entered into ~~an~~ written agreement (contract or MOU) with a verified representative of the dealer, ~~or~~ manufacturer, or financing entity.
- The verified representative of the dealer, ~~or~~ manufacturer, or financing entity has physical custody of the old equipment and has agreed in writing to ensure that the old equipment is delivered to a ~~contracted~~ licensed dismantler ~~within~~ up to 30 ~~calendar~~ days ~~of~~ after the issuance of the check, or has verified that the old equipment has been delivered to a licensed dismantler prior to the issuance of the check.

e) Early reimbursement option - ships at berth grid-based power

The early reimbursement option is only available to seaport equipment owners on ships at berth grid-based power projects.

Local agencies shall approve early reimbursement of up to 80 percent of eligible project costs, provided the equipment owner has expended all non-Program match funding and remains in compliance with the equipment project contract.

Local agencies shall hold a minimum of 20 percent of project funds per berth in retention until post-inspection is complete.

If a small seaport of less than 10 berths experiences difficulties expending all non-Program match funding prior to early reimbursement, the ARB Executive Officer or his or her designee may approve alternate requirements that facilitate project completion and maintain robust accountability.

3. Earned interest

The local agency shall:

- ~~t~~Track the amount of interest earned on Program funds held in local agency accounts, beginning immediately after receipt of Program funds from ARB.
- Maintain Program funds in an interest-bearing account separate from other local agency funds.
- Maintain accounting records (e.g., general ledger) that track interest earned on Program funds on a per grant basis.

~~*a) Calculation of earned interest*~~

~~The local agency shall maintain accounting records (e.g., general ledger) that track interest earned and expenditures on Program funds.~~

- ~~The calculation of interest shall be based on an average daily balance or some other reasonable and demonstrable method of reallocating the proceeds from the fund back into the Program.~~
- ~~Earned interest shall be tracked such that it is separately identifiable from other Program funds.~~
- ~~If the local agency maintains its Program funds in a non-segregated account, the local agency shall maintain accounting records that first separates Program funds from other funds administered by the local agency, and then further separates earned interest and the related expenditures.~~
- ~~Each local agency's methodology for calculating the amount of interest earned on Program funds shall be consistent with how it calculates earned interest for its other fiscal programs.~~

a) Reporting requirement for earned interest

The local agency shall indicate the amount of interest earned and expended on all Program funds in the quarterly- and semi-annual reports, on a per grant basis.

Documentation of earned interest generation and expenditure shall be retained for a minimum of 35 years from the grant agreement date to comply with federal and state bond requirements.

b) Earned interest expenditure provisions

The local agency shall expend interest earned from Program funds on eligible equipment projects ~~(see Chapter IV.C.)~~.

If a local agency is unable to expend all or a portion of the earned interest on eligible equipment projects within a grant, the local agency may request ARB to transfer the interest to another grant. Upon approval of the request, the local agency may utilize the interest on eligible equipment projects.

If the local agency is authorized to use a portion of the grant for administration funds, the local agency may use a portion of the earned interest for administration costs up to the maximum allowed by these Guidelines for that source category to implement additional projects. Interest earned on grants funded by non-taxable bonds (i.e., Build America Bonds) may not be used towards administration costs.

The local agency shall return earned interest within 90 days of the determination that interest cannot be expended, as described in Chapter IV.C.2.

~~If a local agency is unable to expend all or a portion of the earned interest as specified in Chapter IV.C., the remaining earned interest shall be returned to ARB for re-allocation.~~

C. Funding Recapture – Local Agency

1. Process for recapturing funds

A local agency shall obligate and expend Program funds in a timely manner. A local agency shall notify ARB of funds that were not obligated or liquidated by Program deadlines within specified timeframes and may be required to return these funds to ARB per the deadlines established in the grant agreement. ~~may choose to return unused funds to ARB for reallocation ahead of a reversion deadline if the local agency cannot spend the funds prior to the reversion deadline.~~ The ARB Executive Officer or his or her designee has the authority to recapture funds for reallocation and expenditure prior to reversion deadlines, and may amend or modify an impacted grant agreement, or establish a new grant agreement, to implement this policy. The local agency shall agree to comply with the recapture process.

Recaptured funds may become available to a local agency in several ways including, but not limited to, the following:

- Allocated to a local agency by ARB.
- Funds obligated through contract with equipment owners that are returned or not spent prior to the statutory deadline.
- Earned interest held by a local (or State) agency, as permitted by State law and fiscal policies.
- Funds paid to the local agency by equipment owners through voluntary buyout, involuntary buyout (equipment rendered inoperable), or penalties.

2. Expending recaptured funds

The local agency shall obligate and expend recaptured funds according to the following hierarchy:

- Eligible equipment projects on the ARB-approved ranked list for the funding category covered by the grant that generated the funds.
- Eligible equipment projects from a new solicitation for the funding category covered by the grant that generated the funds.
- Upon ARB staff approval, eligible equipment projects for another funding category covered by ~~an existing~~ a grant agreement between the local agency and ARB.

The local agency ~~shall~~ may be required to return recaptured funds to ARB for re-allocation if it cannot expend them according to these priorities:

- With the exception of funds acquired through buyouts and penalties, the local agency shall track fund activity by year of appropriation. A local agency shall also track all fund activity by fiscal year.
- The local agency shall report semi-annually all Program funding activity using the Goods Movement Online Database.

D. Ongoing Local Agency Evaluation of Equipment Projects

Local agencies shall evaluate equipment projects on an ongoing basis. The ongoing evaluation process is designed to meet the accountability requirements of SB 88 and the Governor's Executive Order S-02-07.

Local agency evaluation efforts shall include, but are not limited to: ongoing desk reviews of reports and equipment project updates provided by equipment owners, review of electronic monitoring unit data (as applicable), site inspections, equipment inspections, review of equipment maintenance and activity logs, and other measures deemed appropriate by ARB or the local agency.

Equipment owners shall permit the local agency, ARB, Department of Finance, the Bureau of State Audits, or any authorized designee, access, during normal business hours, to conduct ongoing evaluations for the purpose of monitoring the Program.

E. Local Agency Reporting Requirements

Local agencies shall obtain, verify, and submit to ARB all local agency and equipment project reporting information as outlined in these Guidelines.

1. Quarterly data updates

Local agencies shall submit to ARB quarterly data updates on all local agency projects and the equipment projects associated with each. The local agency shall submit these updates using the Goods Movement Online Database when available.

Local agency quarterly data updates shall begin, at a minimum, one quarter after the beginning of the first solicitation period, and continue until the local agency provides ARB with the local agency project completion report (see below). These quarterly data updates shall be cumulative, reflecting the most current local agency project information. ARB staff may temporarily eliminate this requirement for grants that are suspended, or have recently been suspended, due to lack of bond funding.

Quarterly data updates to ARB shall include the following information, if applicable:

- Start and end dates of most recent equipment project solicitation.
- Updates to each equipment project application received by the local agency through the solicitation process, including:
  - Equipment project application information.
  - Equipment pre-inspection information.
  - Funding status (selected for funding, not funded).
  - Equipment project contract information.
  - Equipment post-inspection information.
  - Equipment project status (active/withdrawn/ineligible).
- Total Program funds obligated.
- Total Program funds expended/remaining (breakdown by project funds and administration funds).
- Total interest earned.

2. Semi-annual report

Local agencies shall submit to ARB semi-annual reports through the Goods Movement Online Database or another method established by ARB.

Local agency semi-annual reports shall begin the year following initial ARB payment of project funds to the local agency, and continue for the term of the grant agreement. ARB staff may standardize the submittal dates for these reports and notify local agencies. Local agencies shall submit semi-annual reports on the schedule established by ARB [H&S §39625.02(f)(1) and Executive Order S-02-07]. The purpose of the report is to ensure that each local agency project is being executed in a timely fashion, within the scope and budget identified when ARB awarded funding.

At a minimum, the semi-annual report shall include the following information:

- All data required in the quarterly report.
- Amount of interest earned from Program funds.
- Recaptured fund activity (see Chapter IV.C.).
- The anticipated costs of the local agency project compared to the total estimated cost in the grant agreement.
- Actions undertaken to ensure funded local agency project is being implemented according to budget allocations or a plan for achieving the benefits of the project by either down-scoping the project or by identifying alternative funding sources to meet any identified cost increases and remain within budget.
- The anticipated duration of the local agency project compared to the original schedule at the time the grant agreement was executed.

- Status of equipment project tracking efforts to ensure compliance with operating conditions, (including the results of the annual reports submitted by the equipment owners, (once available). The results of the equipment owner's annual reports shall be submitted annually, on a schedule to be determined by ARB.
- Status of equipment owner reporting compliance.
- A document signed by the local agency's Chief Administrative Officer, Chief Financial Officer, or Program Grant Administrator verifying that the equipment project and financial data submitted in the report is complete, accurate, and that there are no known instances of fraud.
- Any other information requested by ARB staff.

3. Local agency project completion report

Local agencies shall submit to ARB a local agency project completion report no later than 6 months following the full local agency liquidation of Program funds under the grant agreement [H&S §39625.02(f)(2)]. This report shall provide information regarding the specific local agency expenditure of Program funds on administration and equipment project costs.

At a minimum, the local agency project completion report shall include the following, as applicable, based on specific guidance from ARB staff:

- The final costs of the local agency project compared to the total estimated cost in the grant agreement.
- The duration of the local agency project compared to the original schedule at the time the grant agreement was executed.
- The performance outcomes of the project (number of pieces of cleaner equipment and reductions in PM and NOx emissions) compared to the performance benchmarks identified in the grant agreement.

V. State Agency Project Implementation

ARB will enter into interagency agreements with other State agencies that are awarded funds for a truck loan or loan guarantee program (loan project). If ARB is the State agency, no interagency agreement is required. The interagency agreement shall specify the requirements that the State agency and/or its contractor(s) must meet. These include implementation and funding requirements.

A. Implementation Requirements

A State agency implementing a loan project (either directly or through contractors) must meet the following conditions:

- Use funds to upgrade or replace eligible diesel trucks according to the project specifications in Appendix A.
- Adhere to any financial terms and conditions established by ARB staff, which may include interest rate, loan term, and minimum credit requirements.
- Maintain a public website.
- Use marketing strategies in partnership with ARB and local agencies to target independent owner-operators and smaller fleets that need financial assistance.

For loan project applicants who are not receiving a Program grant, the State agency or its contractor(s) shall also:

- Determine that the applicants meet the Program eligibility requirements.
- Conduct a compliance check on the old vehicle and the equipment owner.
- Perform pre-inspections of old equipment.
- Perform post-inspections of new equipment.
- Ensure old equipment is scrapped.

B. Transfer, Obligation, and Expenditure of Funds

Funds will be considered obligated when available to ARB for expenditure and upon execution of the interagency agreement. ARB will transfer the funds to the State agency according to the terms of the interagency agreement.

If no interagency agreement is required because ARB is the recipient, funds are considered obligated when they are awarded by the Board and available to ARB for expenditure. Funds are considered expended (liquidated) when the State agency or its contractor(s) has completed the transaction which may include: executing loan documents, transferring funds into an account for loan guarantees, or transferring funds for interest rate subsidies.

C. Ongoing Evaluation of Loan and Loan Guarantee Programs

State agencies and any contractor(s) shall evaluate loan and loan guarantee projects on an ongoing basis to meet the accountability requirements of SB 88 and the Governor's Executive Order S-02-07. The State agency shall include information in its application to ARB for funding that describes the proposed actions to evaluate these projects. ARB shall include appropriate provisions for ongoing evaluations in the interagency agreement.

Equipment owners shall permit the State agency, ARB, Department of Finance, the Bureau of State Audits, or any authorized designee, access, during normal business hours, to conduct ongoing evaluations for the purpose of monitoring the Program.

D. State Agency Reporting Requirements

1. Semi-annual report

State agencies shall obtain, verify, and submit to ARB all equipment project reporting information as described below.

- Total number of truck projects funded, including the number of retrofits and replacements by loan type.
- Total Program funds obligated and liquidated.
- Amount of interest earned from Program funds.
- A cumulative list of all loan and loan guarantee projects funded under the interagency agreement.
- A document signed by an authorized individual of the State agency verifying that the equipment project and financial data submitted in the report is complete, accurate, and that there are no known instances of fraud.
- Any other information requested by ARB staff.

2. Project completion report

State agencies shall submit to ARB a local agency project completion report no later than 6 months following the full local agency liquidation of Program funds under the interagency agreement [H&S §39625.02(f)(2)].

This report shall provide information regarding the expenditure of Program funds on administration and equipment project costs.

The State agency project completion report shall include the following, as applicable based on specific guidance from ARB staff:

- The final costs of the project compared to the total estimated cost in the interagency agreement.
- The duration of the project compared to the original schedule at the time the interagency agreement was executed.
- The performance outcomes of the project (number of cleaner trucks funded compared to the performance benchmarks identified in the interagency agreement).
- A list of the completed loan and loan guarantee projects.
- Amount of interest accrued on Program funds.
- List and description of equipment projects funded with earned interest.
- A document signed by an authorized individual of the State agency verifying that the equipment project and financial data submitted in the report is complete, accurate, and that there are no known instances of fraud.

VI. General Equipment Project Requirements

A. Ownership Requirements

Equipment project applications shall be signed and submitted by the current legal owner of the existing equipment that will be upgraded or replaced. Equipment project applications for ships at berth, truck electrification infrastructure, and locomotive emissions capture and control system projects shall be signed and submitted by the future owner of the new equipment because there is no existing equipment.

Non-owner applications are not eligible for funding.

Ownership of the existing equipment shall not change from the time an equipment project application is submitted through receiving Program funding. Refer to Chapter VI.E. for additional requirements to maintain eligibility.

Individuals or companies that operate the existing equipment under a lease agreement with the equipment owner are prohibited from applying for bond funding.

Individuals or companies that currently own the equipment but will operate the replacement equipment under a lease-to-own agreement may participate if a lease-to-own program is offered by the local agency according to the provisions described in Chapter IV.A.13.

The owner of existing equipment applying for truck replacement under a lease-to-own program may apply jointly with the proposed lessor or lessee.

B. Third Party Applications

Third party applications are not allowed. The owner of the existing equipment must sign and agree to the submittal of the equipment project application. If there is no existing equipment, the owner of the future Program-funded equipment shall sign and agree to the submittal of the equipment project application.

A third party may, however, complete an application (in whole or in part) on the owner's behalf. Equipment project applications shall include a signature section for third parties. The third party signature section shall include signature and date lines, and blanks for the third party to list how much they are being paid, if anything, to complete the application and what source of funds are being used to pay them.

C. Equipment Project Specifications

Equipment owners may refer to Appendices A-HF for descriptions and specifications for the equipment projects eligible for Program funds. Equipment projects shall comply with all requirements and restrictions in the Guidelines, except for those allowable alternatives that the local agency is approved to implement, consistent with Chapter III.C.

Equipment owners are advised to carefully review the information packets provided by local agencies during the equipment project solicitation period.

D. Equipment Project Application Requirements

1. Equipment project information

Equipment owners are required to provide project application information for the applicable equipment project option identified in Appendices A-HF. This typically includes information on: the equipment owner, the existing equipment, the proposed equipment project (with funding level and project life), costs, schedules, and operational/activity data to quantify the benefits of the equipment project.

2. Equipment project schedule

As part of the application, equipment owners shall commit to meeting project schedule requirements listed in the equipment project application for the major milestones listed by source category in Appendices A-HF. The equipment project schedule shall also be included as part of the equipment project contract signed between the local agency and equipment owner. Adjustments to the schedule prior to contract execution may only occur with local agency consent.

3. Case-by-case equipment projects

Only equipment project options specifically identified in these Guidelines shall be eligible for Program funds. Equipment project options beyond those identified in these Guidelines may be recommended to ARB staff for inclusion in future Guideline updates.

4. Certifications and disclosures

Equipment project applications shall include certifications and disclosures that the equipment owner shall sign, that include, at a minimum:

- Certification that the equipment owner has reviewed the application and that the application information is correct.
- Certification that once the equipment owner submits the equipment project application, the owner shall not submit other applications to local agencies in any trade corridor for funding for the same truck, locomotive, equipment, vessel, berth, or facility under this Program or the Carl Moyer program. This prohibition does not include applications for loans or loan guarantees.
- Certification that the equipment owner agrees to all requirements of the Guidelines.
- Certification that the Program-funded equipment shall be placed into operation and post-inspected prior to the applicable operational deadlines to remain eligible for funding.
- Certification that the Program-funded equipment may not be used by the equipment owner to comply with any applicable ARB regulations for the specified timeframe. ARB will post and update information on the Program website describing operational deadlines and when the Program-funded vehicle will become eligible to be included in the equipment owner's fleet compliance strategy for the applicable project option.
- Certification that neither the owner nor equipment identified in the equipment project application has any outstanding ARB violations ~~of~~ or non-compliance with ARB regulations.
- Disclosure of any other source(s) of funding that the equipment owner has applied for that would be used for the same equipment project. The disclosure shall identify the source of funds, how much is being applied for, and what the funding would be used for.
- Disclosure of the value of any existing financial incentive that directly reduces the project cost, including tax credits or deductions, grants, or other public financial assistance, for the same equipment project.
- Certification that Program funds were not used to previously upgrade the equipment identified in the equipment project application, except for funds received to retrofit a truck with a diesel PM filter.
- Certification that equipment project match funding is reasonably available to complete the equipment project according to the proposed timeframe.
- Certification that the equipment must **not** be purchased, received, installed, paid for, or placed into operation prior to contract execution, unless specified in these Guidelines. If allowed, the equipment owner shall assume all financial risk and is in no way assured Program funds.
- Certification that any equipment purchased outside of California may be subject to California sales or use tax.

- Certification that the equipment owner has all the information needed to understand what must be done to maintain eligibility for Program funds. This includes maintaining ownership; maintaining registration; keeping equipment in legal operating condition within California; correcting any air pollution citations; complying with all ARB regulations; and reporting, repairing, or replacing equipment that has been damaged, destroyed, or stolen. ARB staff shall develop, and make available on the Program website, a fact sheet for all local agencies for incorporation or attachment to the application.

Source category-specific requirements listed in Appendices A-H shall be used to customize the equipment project application, certifications, and disclosures.

The equipment owner may be allowed to re-apply for equipment project funding if a previous application for the same project has been rejected and is no longer being considered by a local agency for funding.

An equipment owner who is found to have submitted multiple applications for the same equipment project and not disclosed any other requested, or received financial incentive may be disqualified from funding for that engine, ~~or~~ piece of equipment, or vehicle under this Program. The equipment owner may also be prohibited from submitting future applications to any and all ARB incentive programs~~, or local agency incentive programs~~.

5. Equipment project funding demonstration

Equipment project applications shall list the source(s) funds to complete the proposed equipment project, including the proposed Program funds, and matching funds from other State, local, federal, or private sources. The equipment owner may be required to demonstrate fund availability or provide proof of approved financing at any time during the application and review process.

Equipment project applications may identify any loan or lease-to-own programs the equipment owner intends to utilize to fully fund the equipment project.

The total project cost shall include the purchase price of the equipment, including shipping charges, and the cost of installation or construction (as applicable). Installation costs shall only include installation of the components necessary to operate the equipment.

- Program funds may only be used for eligible expenses.
- Optional items (such as cigar lighters or custom mud flaps on trucks) shall be paid at the owner's expense.
- Taxes, fees, insurance, and other charges may not be included as part of the total project cost.

- Electricity and fuel costs may not be included in the project cost.
- Costs for equipment and parts on engine repower projects are only eligible for funding if they are required to ensure the effective installation and functioning of the new engine, and achieve the expected emissions performance, but are not part of typical vehicle or equipment maintenance or repair. Examples of ineligible repower costs include, but are not limited to: tires, axles, paint, brakes, and mufflers.

The equipment owner may estimate the total project cost in the first year of operation.

E. Equipment Owner Requirements to Maintain Eligibility

Equipment owners shall maintain Program eligibility for their equipment projects throughout the funding process. Project information may change between the time of submitting an application and receiving Program funding.

For truck projects, the equipment project shall meet, at a minimum, the following requirements at all times:

- Ownership of the equipment matches what is listed on the application.
- Equipment is in legal operation at all times, travels in California at least 75 percent of the time, and moves goods a majority of the time.
- Equipment is in conformance with the minimum operational requirements listed in the application materials, solicitation, and Guidelines.
- Equipment owner maintains California base-plated registration or California IRP. Non-operational registration is prohibited. Dual plates and out-of-state registration, including out-of-state IRP, are prohibited, except for trucks that carry goods across the California-Mexico border, as they are required to be dual-plated (California and Mexico only).
- Equipment owner and fleet remain in compliance with all ARB regulations (Program-funded trucks cannot be used towards compliance for the specified timeframe).

For truck projects, the equipment owner shall notify the local agency as soon as possible if anything about a project changes, as there may be circumstances where a project becomes ineligible. Under limited circumstances, changes which may be allowed include:

- Equipment operation (equipment becomes inoperable, destroyed, or stolen; see Appendix I.).
- Equipment owner's request to reinstate a withdrawn application or contract (see Chapter VI.G.).

For all other projects, the equipment owner shall contact their local agency as soon as possible if anything about a project changes to determine if project eligibility can be maintained.

F. Equipment Project Operation

Equipment owners with executed equipment project contracts shall be responsible for the operation of equipment funded under this Program, in compliance with the conditions of the contract. Except for approved truck lease-to-own programs, equipment owners may not assign, sell, transfer, license, or subcontract any rights or obligations to a third party without the express prior written consent of the local agency.

G. Equipment Project Contract Cancellation/Reinstatement

Equipment owners may request to withdraw or cancel their equipment project contract without any obligation, prior to payment of Program funds. Notification to the local agency shall be in writing.

Reinstatement of a withdrawn or cancelled project is at the local agency's discretion, subject to the availability of Program funds, and shall include, but is not limited to the following provisions:

- The equipment owner's request for reinstatement shall be in writing.
- Only equipment projects on the ARB approved ranked list may be reinstated.
- No equipment project that received a funding commitment shall be displaced as a result of reinstating a withdrawn project.
- The equipment project and owner meet all Program eligibility requirements.

H. Equipment Accidentally Rendered Inoperable, Destroyed, or Stolen

1. Equipment project application has been submitted and existing equipment is not yet replaced

If the existing equipment is accidentally rendered inoperable, destroyed, or stolen prior to replacement, the project may, in some cases, remain eligible for funding if the equipment owner promptly notifies the local agency and takes action using one of the remedies listed in Appendix I.

2. Replacement equipment has been placed into operation

If the Program-funded equipment is accidently rendered inoperable, destroyed, or stolen during the term of the equipment project contract, the equipment owner must promptly notify the administering local agency and coordinate a remedy consistent with the terms of the contract and these Guidelines. The Program-funded equipment may be repaired or replaced at the equipment owner's expense subject a pre-inspection, as described in Chapter IV.A.10.

If the equipment owner's insurance company or the local agency determines that Program-funded equipment has been accidentally rendered inoperable or destroyed, the equipment owner may replace the inoperable or destroyed equipment with equipment certified to equal or lower emission levels, and continue with the terms of the original contract or request to close-out the terms of the contract with the local agency. The equipment owner shall notify the local agency if that owner chooses to use his/her own funds to replace the inoperable equipment with equipment certified to equal or lower emission levels, and continue with the terms of the original contract. The equipment owner shall be responsible for providing the local agency with updated information for the new equipment.

If the equipment owner reports to the local agency that the Program-funded equipment has been stolen, and this is confirmed by a police report and an insurance company determination of loss due to theft, the equipment owner may replace the stolen equipment with equipment certified to equal or lower emission levels at his/her own cost, and continue with the terms of the original contract or request to close-out the terms of the contract with the local agency.

The equipment owner shall notify the local agency if he or she chooses to close-out the contract due to accident or theft. The equipment owner shall provide supporting documentation (e.g., salvage title, policy report, insurance company determination, copy of insurance company reimbursement quote/check, and/or other) to the local agency exhibiting that the equipment was accidentally rendered inoperable or stolen and remit the following amount to the local agency:

Insurance reimbursement amount (minus any lien amounts), or

$$\text{Contract Recapture Amount} = \text{Contract Value} - \left(\text{Elapsed Equipment Project Life} \times \frac{\text{Contract Value}}{\text{Equipment Project Life}} \right)$$

Example: An equipment owner receives $50,000 in Program funding for a truck replacement project. The owner signs an equipment project contract for 5 years (60 months). After 3 years and 6 months (42 months) from the project being post-inspected and placed into operation, the equipment is rendered inoperable according to the above description. The equipment owner may request to close-out the terms of the contract and pay $15,000 to the local agency.

Contract Recapture Amount: $15,000 = $50,000 – (42 months x ($50,000/60 months))

I. Equipment Transfer/Sale/Replacement Requirements

Equipment owners with executed equipment project contracts with a local agency shall be fully and legally responsible for the operation of equipment funded under this Program in compliance with the conditions of the contract. Equipment owners may not assign, sell, transfer, license, or subcontract any rights or obligations to a third party without the express prior written consent of the local agency.

If the original owner of Program-funded equipment chooses to sell the equipment for any reason, or is required or chooses to replace the equipment with cleaner equipment prior to the end of the equipment project life, the original owner shall notify the local agency in writing and receive prior written consent for the transaction from the local agency.

Prior to completing the replacement transaction, the original owner shall make the new truck available for inspection by the local agency to verify it meets Program requirements.

Prior to completing the sales transaction, the original owner shall inform the party purchasing the equipment of the equipment project contract provisions, and disclose the remaining contract term. The original owner shall be responsible for establishing contact between the new owner and local agency to facilitate the transfer of the contract provisions and terms. The original owner shall be responsible for providing the local agency with the purchase price of all sold Program-funded equipment.

The original owner shall provide the prospective new owner with valid contact information for the local agency so the new owner can assume legal responsibility under the original contract or enter into a new equipment project contract with the local agency, for the remainder of the contract term. The original equipment owner who received Program funding shall not be relieved of his or her legal obligation to fulfill the conditions of the contract unless the new owner has assumed responsibility through an executed contract with the local agency.

If the equipment is sold, and the original equipment owner failed to fulfill the responsibilities described in this section, remedies for equipment project non-performance shall be imposed (see Chapter VI.K.).

J. Optional Equipment Project Contract Buy-Out

If the owner of Program-funded equipment cannot meet the obligations of the equipment project contract for any reason and does not use the options in ~~Sections F and~~ Chapter VI.G~~-I. above~~, the owner may request to buy-out the remaining time on the contract prior to the end of the contract term. The owner shall notify the local agency in writing and receive prior written consent for the transaction from the local agency. The equipment owner shall remit the contract buy-out amount to the local agency, based on the remainder of the contract value and an Administrative Fee. Any monies received by the local agency under this buy-out provision shall be treated as recaptured funds subject to the requirements of Chapter IV.C. The contract buy-out amount shall be determined according to the formula shown below.

Equipment Project Contract Buy-Out Formula:

$$\text{Contract Buy-Out Amount} = \left(\text{Contract Value} - \frac{\text{Elapsed Equipment Project Life} \times \text{Contract Value}}{\text{Equipment Project Life}}\right) + \text{Admin Fee}$$

The Administrative Fee shall be:

- $5,000 for truck projects.
- $10,000 for locomotive, commercial harbor craft, and cargo equipment projects.
- $250,000 for ships at berth projects.

Example: An equipment owner receives $50,000 in Program funding for a truck replacement project. The owner signs an equipment project contract for 5 years (60 months). After 3 years and 6 months (42 months) from the project being post-inspected and placed into operation, the equipment owner requests to close-out the outstanding contract. The equipment owner may request to close-out the terms of the contract and pay $20,000 to the local agency.

Contract Buy-Out Amount: $20,000 = ($50,000 - (42 months x ($50,000/60 months))) + $5,000

K. Equipment Project Non-Performance

All equipment project contracts signed by the equipment owner shall include non-performance provisions enforceable by the local agency. Non-performance includes, but is not limited to:

- Failure to meet the terms and conditions of an executed equipment project contract, including, but not limited to, equipment operating conditions and geographic restrictions.
- Equipment/engine/vehicle is non-operational, malfunctioning, or damaged.
- Failure to operate or maintain equipment in accordance with manufacturer's recommendations.
- Failure to meet established deadlines for equipment project completion.
- Failure to allow for an electronic monitoring device, or tampering with an installed device or data.
- Misuse of direct payments to vendors provisions.
- Insufficient, incomplete, or faulty equipment project documentation.
- Failure to provide required documentation or reports in a timely manner.

Remedies for equipment project non-performance may include, but are not limited to:

- Recovery of all or a portion of Program funds.
- Other fiscal penalties on equipment owners based on the severity of the non-performance.
- Cancellation of the contract.
- A ban on the equipment owner's ability to participate in future State incentive programs.
- Prohibiting a specific engine, piece of equipment, or vehicle from participating in another State incentive program.

APPENDICES

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APPENDICES A-E

Project Specifications for FY2012-13 (Year 4) and Later Funds by Source Category

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APPENDIX A Heavy Duty Diesel Trucks

A. Equipment Project Specifications

Eligible Equipment	Heavy duty diesel trucks used to move goods (a majority of the time) for the past 2 years, with an original manufacturer's gross vehicle weight rating (GVWR) of 19,501 lbs or greater listed on the application and verified at pre-inspection.
	Equipment owner must demonstrate:
	• Fleet compliance with the Statewide Truck and Bus Rule.
	• California operation:
	  o At least 75% operation within California for the past 2 years.
	  o Annual vehicle miles traveled (VMT) in California each year for the past 2 years:
	  ▪ At least 20,000 miles for Class 8 trucks (33,001 lbs GVWR or greater).
	  ▪ At least 20,000 miles for Class 7 trucks (26,001 - 33,000 lbs GVWR).
	  ▪ At least 10,000 miles for Class 6 trucks (19,501 - 26,000 lbs GVWR).
	• California registration:
	  o Current registration and prior registration for the past 2 years[1]. Eligible registration types include:
	  ▪ California base-plated registration, OR
	  ▪ California International Registration Plan (California IRP), OR
	  ▪ Dual-plated registration (California based-plated/California IRP and Mexico only) for trucks carrying goods across the California-Mexico border, as they are required to be dual-plated.
	[1]Note: The past 2 years means the current year (1-12 months prior to application date) and prior year (13-24 months prior to application date).

Ineligible Equipment	• Trucks subject to ARB's Drayage Truck Rule (see Chapter I, Table I.4). • Trucks subject to ARB's Public and Utility Fleet Rule. • Trucks subject to ARB's Solid Waste Collection Vehicle Rule. • Trucks subject to ARB's Diesel Cargo Handling Equipment Rule. • Trucks not in compliance with the Statewide Truck and Bus Rule. • Trucks registered outside the State of California, including dual-plated registration, except for trucks that carry goods across the California-Mexico border, as they are required to be dual-plated, as described above. • Trucks which are a salvage vehicle (see Chapter I, Table I.4). • Trucks constructed from a glider kit, unless allowed by the local agency for an old, existing truck to be replaced. Glider kit trucks may not be repowered or utilized as a replacement truck. • Repowered trucks when used as a replacement truck.
General Requirements Applicable to All Truck and Truck Electrification Infrastructure Project Options	Equipment owner shall: • Commit to the project life specified with the applicable equipment project option. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Demonstrate proof of equipment warranty on the Program-funded equipment. • Certify that there are no outstanding ARB violations or non-compliance with ARB regulations associated with the equipment or the owner. For the duration of the project life, the equipment owner shall: • Adhere to all Program requirements. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Properly maintain new or upgraded equipment in good operating condition and according to manufacturer's recommendations.

Heavy Duty Diesel Trucks (cont.)

General Requirements Applicable to All Truck Project Options	The equipment owner shall: • Maintain fleet compliance with the Statewide Truck and Bus Rule without utilizing Program-funded equipment until the specified timeframe. ARB will post and update information on the Program website describing operational deadlines and when the Program-funded vehicle will become eligible to be included in the equipment owner's fleet compliance strategy for the applicable project option. For the duration of the project life, the equipment owner shall: • Commit to move goods a majority of the time. • Maintain California base-plated registration or California IRP, except as described in Eligible Equipment previously listed including no out-of-state and non-California IRP registration. • Commit to 100% California-only operation (or 90% California operation as selected by the equipment owner). • Commit to at least 50% of travel within the four California trade corridors. • Agree to accept an on-board electronic monitoring device at any time. • Maintain collision/comprehensive insurance on the truck for replacements.
General Requirements Applicable to All Engines for Repower or Replacement Project Options	Program requirements for **engines** for repower or replacement projects must be certified by an ARB Executive Order for on-road use with the following: • 2010 emissions – 0.20 grams per brake-horsepower hour (g/bhp-hr) or less NOx (FEL and CERT values) and 0.01 g/bhp-hr or less PM (CERT value). • Class 8 truck - intended service of Heavy Heavy Duty (HHD) for diesel engines or Heavy Duty Otto (HDO) for applicable alternative fuel vehicles. • Class 7 truck - intended service of Medium Heavy Duty (MHD) or HHD for diesel engines or HDO for applicable alternative fuel vehicles. • Class 6 truck - intended service of MHD for diesel engines or HDO for applicable alternative fuel vehicles. • Class 6-8 trucks – all heavy duty hybrid or electric vehicles shall follow ARB's Heavy Duty Hybrid Electric Vehicle Certification Procedure.

General Requirements Applicable to All Trucks Replacement (New or Used) Project Options)	Program requirements for **trucks** (new or used) purchased for replacement projects must meet the following:
	• Original manufacturer's GVWR:
	  o Class 8 (33,001 lbs or greater).
	  o Class 7 (26,001 - 33,000 lbs).
	  o Class 6 (19,501 - 26,000 lbs).
	• Same weight classification range (Class 8, Class 7, or Class 6) as the existing truck, except under the following conditions:
	  o Equipment owner chooses to replace 2 eligible trucks for 1 replacement truck under Option (3).
	  o Replacement required by the equipment owner in order to meet a vocational need, as approved by the local agency.
	  o Replacement of a Class 7 truck with a Class 8 truck, as long as both trucks have a HHD engine.
	• Maximum truck VMT, with odometer verification during post-inspection:
	  o Class 8 (less than 500,000 miles).
	  o Class 7 (less than 250,000 miles).
	  o Class 6 (less than 250,000 miles).
	• Original equipment manufacturer engine installed in a chassis of the same model year, make, and configuration as was originally provided from the truck manufacturer when the chassis and engine were both new.

Heavy Duty Diesel Trucks (cont.)

Modifying an Application (applicable to truck projects only)	Equipment owners may change the equipment project option (replacement, repower, or three-way truck transaction) or lease-to-own program participation after the local agency solicitation period has closed if permitted by the local agency and subject to the following requirements: • The change must result in a funding amount equal to or less than the amount that was requested in the original application. • The change must result in a calculated project cost-effectiveness equal to or greater than the project listed in the original application. • The change must result in the project remaining above the funding line on the ranked list. Notes: Unless specifically allowed in these Guidelines, equipment owners cannot substitute a different vehicle or change the ownership of the existing vehicle identified on the application after the local agency solicitation period has closed.
Option (1) Repower	Partial funding (see options below) to repower a truck equipped with an eligible heavy duty diesel engine with a new MY2013 or newer engine that meets 2010 emissions. Eligible projects include: • Class 8 or Class 7 truck with a MY1994-2006 engine. • Class 6 truck with a MY1996-2006 engine.
Funding Options	1. $20,000/truck to repower a Class 8 or Class 7 truck with a new MY2013 or newer HHD engine that meets 2010 emissions. 2. $10,000/truck to repower a Class 7 or Class 6 truck with a new MY2013 or newer MHD engine that meets 2010 emissions.
Requirements	Program-funded engine shall be installed and operational (post-inspection completed, except scrappage) prior to a regulatory requirement for that technology or level of emissions control under applicable provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing operational deadlines for the applicable project option. In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of 5 years or 500,000 miles, whichever comes first. • Scrap the old engine. • Purchase a minimum of a 1-year or 100,000-mile major component engine warranty that covers parts and labor (if the truck is no longer under warranty or has less than 1 year of warranty). • Provide a copy of ARB Executive Order documenting that the new engine meets 2010 emissions.

Heavy Duty Diesel Trucks (cont.)

Option (2) Replacement	Partial funding (see options below) to replace 1 or 2 truck(s) equipped with an eligible heavy duty diesel engine(s) with a diesel, alternative fuel, or zero-emission truck. Eligible projects include: • Class 8 or Class 7 truck(s) with a MY1994-2006 engine. • Class 6 truck(s) with a MY1996-2006 engine.
Funding Options	Class 8 truck: 1. $50,000/truck for a new replacement truck with a MY2013 or newer engine that meets 2010 emissions. AB 118 funds, if available, may be added for projects utilizing a zero-emission engine. 2. $40,000/truck for a used replacement truck with a MY2010 or newer HHD engine that meets 2010 emissions. Notes: The maximum grant amount will be reduced by the amount received if the Program previously funded the installation of a diesel particulate filter. Class 7 truck: 1. $35,000/truck for a new or used replacement truck with a MY2010 or newer engine that meets 2010 emissions. AB 118 funds, if available, may be added for projects utilizing a zero-emission engine. Notes: The maximum grant amount will be reduced by the amount received if the Program previously funded the installation of a diesel particulate filter. Class 6 truck: 1. $25,000/truck for a new replacement truck with a MY2013 or newer engine that meets 2010 emissions. AB 118 funds, if available, may be added for projects utilizing a zero-emission engine.
Requirements	Program-funded replacement projects shall be purchased and operational (post-inspection completed, except scrappage) prior to a regulatory requirement for that technology or level of emissions control under applicable provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing operational deadlines for the applicable project option. In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of at least 5 years or 500,000 miles, whichever comes first. • Scrap the old truck(s). • Purchase a minimum of a 1-year or 100,000-mile major component engine warranty for the replacement vehicle that covers parts and labor (if the truck is no longer under warranty or has less than 1 year of warranty). • Provide a copy of ARB Executive Order documenting that the replacement truck engine meets 2010 emissions.

Heavy Duty Diesel Trucks (cont.)

Option (3) Three-Way Truck Transaction	1. Replace an eligible truck that has a MY1998-2006 engine and Level 3 PM retrofit (Truck A) with a diesel or alternative fuel truck (Truck C) with an engine that meets 2010 emissions. 2. Scrap a MY1993 or older diesel truck (Truck B) and replace with Truck A. Truck A: Heavy duty diesel truck with MY1998-2006 engine and Level 3 PM retrofit. Truck B: Heavy duty diesel truck with MY1993 or older engine that has demonstrated compliance with the Statewide Truck and Bus Rule until 12/31/2015 or later. Truck C: Heavy duty truck (diesel or alternative) that meets 2010 emissions. Notes: • Truck C must be the same class as Truck A. • Truck C must have less than 500,000 miles if Class 8 (250,000 miles if Class 7 or 6), with odometer verification at the post-inspection. • Truck B may be Class 8, Class 7, or Class 6. • Truck A shall be equipped with an operational diesel particulate filter.
Funding Options	1. $50,000 for new Truck C if Truck A is Class 8. 2. $40,000 for used Truck C if Truck A is Class 8. 3. $35,000 for new or used Truck C if Truck A is Class 7. 4. $25,000 for new Truck C if Truck A is Class 6.
Requirements	Truck C shall be purchased and operational (post-inspection completed, except scrappage) prior to a regulatory requirement for that technology or level of emissions control under applicable provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing deadlines for the applicable project option. In addition to the applicable General Requirements listed previously, the original owner of Truck A and new owner of new Truck C shall: • Transfer ownership (if applicable) of Truck A to the owner of old Truck B. • Commit to a project life of 5 years or 500,000 miles, whichever comes first, on Truck C. • Commit to 90% or 100% California-only operation for the duration of the project life. • Purchase a minimum of a 1-year or 100,000-mile major component engine warranty for Truck C that covers parts and labor (if Truck C is no longer under warranty or has less than 1 year of warranty). • Provide a copy of ARB Executive Order documenting that the new truck engine in Truck C meets 2010 emissions. • Demonstrate that any mid-1990s engine subject to the software upgrades for diesel trucks (i.e., chip reflash) has completed the upgrade on Truck A. In addition to the applicable General Requirements listed previously, the original owner of old Truck B must scrap Truck B.

Heavy Duty Diesel Trucks (cont.)

Option (4) Truck Electrification Infrastructure	Truck stops, intermodal facilities, distribution centers, and other places where heavy duty diesel trucks congregate within the four California trade corridors.
Funding Option	Landside truck electrification infrastructure to reduce diesel engine idling and use of diesel-fueled internal combustion auxiliary power systems may be funded at the lower of 50% of eligible project costs or a level commensurate with a cost-effectiveness of 0.10 pounds of weighted emissions reduced per State dollar invested. Projects shall be eligible to compete for funding only if the cost-effectiveness is equal to or greater than 0.10 pounds of weighted emissions reduced per State dollar invested. Eligible costs include purchase and installation of electrical infrastructure or equipment to: enable heating, cooling, and the use of cab power for parked trucks at truck stops; and enable the use of power for transport refrigeration units (TRUs) and auxiliary power systems at distribution centers, intermodal facilities, and other places where trucks congregate. Total reimbursement of eligible costs shall be based on demonstrated use over the first year of operation. If the actual usage for the first year of operation is less than the projected usage, the maximum allowable reimbursement payment shall be pro-rated based on the following formula: $\text{Maximum Reimbursement (\$)} = \left(\text{Original Maximum Reimbursement (\$)} \times \frac{\text{Actual Usage (\# of hours)}}{\text{Projected Usage (\# of hours)}} \right)$ Ineligible costs include on-board auxiliary power units and other equipment installed on trucks, equipment, and services unrelated to heating and cooling (e.g., telephone, internet, television, etc.); TRUs; electricity costs; and operation and maintenance costs.
Requirements	In addition to the General Requirements listed previously, equipment owner shall: • Commit to 10 years of operation. • Comply with all local permitting requirements.
Project Cost Assumptions	• Option (1): Total cost of a repower project is expected to be ~$40,000 for a Class 8 or Class 7 truck and ~$20,000 for a Class 6 truck. • Options (2) & (3): Total cost of a truck meeting 2010 emissions is expected to be ~$30,000 for a Class 6 truck to ~$300,000 for a Class 8 electric truck. • Option (4): Total cost for distribution centers is $1,500-$7,000/plug at dock; $2,500-$9,000/plug in parking areas; $500-$2,000/adapter for trailers and TRUs. Total cost for truck stops is $6,000-$18,000/parking space and $3,000/truck modification.

B. Major Milestones for Project Completion

1. Heavy duty diesel trucks

- Equipment order.
- Equipment acquisition/installation.
- Submittal of invoice to local agency for payment.
- Scrappage of old truck or engine.

2. Truck electrification infrastructure

The equipment project schedule shall include, but is not limited to, the following milestones:

- Completion and certification of any required California Environmental Quality Act (CEQA) documents.
- Bid solicitation, evaluation and award, and construction contract.
- Acquisition of any local permits, or other requirements.
- Electrification system design, unit acquisition, and delivery.
- Project completion.
- Post-inspection by local agency.
- Reporting to local agency of actual electrical use by trucks during first year of operation.
- Submittal of invoice to local agency for reimbursement.

C. Application Information

Equipment owners shall provide the following information and documentation in addition to the requirements described in Chapter VI., and other information ARB or local agencies may request on the equipment project applications. The local agency shall enter or import the equipment application information into the Goods Movement Online Database.

All equipment project applications must include the information specified below in:

- Section 1 – General information.
- Section 2 – Current equipment and activity information.
- Section 3 – Proposed equipment project information (include, as applicable, for each equipment project option.)

1. General information

a) Heavy duty diesel trucks

- Name of applicant (current legal owner of existing truck).
- Business name.
- Truck Regulation Upload, Compliance, and Reporting System Identification Number (TRUCRS ID Number).
- Mailing address.
- Primary contact name and phone number.
- Person with equipment contract signing authority (owner) for companies and partnerships with multiple employees.
- Fleet size.
- A statement signed and dated by the current equipment owner acknowledging all application items are true/correct and all outstanding violations of ARB regulations associated with the equipment or the owner will be corrected.

b) Truck electrification infrastructure

- Name of applicant.
- Business name.
- Mailing address.
- Primary contact name and phone number.
- Person with equipment contract signing authority (owner) for companies and partnerships with multiple employees.
- Number of truck spaces (for truck stops) or number of docks (distribution centers).
- A statement signed and dated by the current equipment owner acknowledging all application items are true/correct and all outstanding violations of ARB regulations associated with the equipment or the owner will be corrected.

2. Current equipment and activity information

a) Heavy duty diesel trucks

- Truck data.
  - Truck make and model year.
  - Vehicle Identification Number (VIN).
  - Original manufacturer's gross vehicle weight rating (GVWR) as shown on the vehicle door tag (if the door tag is not available, see Chapter IV.A.5. for assistance).
  - Vehicle license plate number.
  - Engine year and serial number.
  - Engine fuel type.
  - Current odometer reading (estimate total engine mileage if odometer is missing or broken).
  - Date a diesel particulate filter was previously installed on truck and verified control level of that filter (if applicable).

- Truck documentation.
  - Current ownership (copy of title of truck or registration).
    - For any truck that will be scrapped or reused.
    - Not applicable to repower projects.
  - Vehicle miles traveled (VMT) in California for the past 2 years.
    - Odometer readings (required) at least 6 months apart including any of the following records or combination of records:
      - Pre-inspection reading.
      - Maintenance records.
      - Biennial Inspection of Terminals (BIT inspection).
      - International Fuel Tax Agreement (IFTA) records.
      - Alternate documentation, as approved by the local agency.
  - California registration.
    - Eligible registration types include:
      - California base-plated registration, OR
      - California International Registration Plan (California IRP), OR
      - Dual-plated registration (California based-plated/California IRP and Mexico only) for trucks carrying goods across the California-Mexico border, as they are required to be dual-plated.
    - Current registration.
    - Registration for the past 2 years.
      - Current year (1-12 months prior to application date) and prior year (13-24 months prior to application date).
      - California Department of Motor Vehicles (DMV) registration cards for the past 2 years or California DMV Vehicle Registration Information Record (DMV printout).
        - The DMV printout may be obtained by submitting a Request for Driver Record Information (INF 1125) form to the DMV.
        - The DMV printout must show registration in both the current year and prior year (as defined above) with a minimum of 6 months of total registration.
        - If the DMV printout shows registration in the current year of 8 months and no registration in the prior year, alternative documentation (insurance certificate or BIT inspection) may be used to show operation in the prior year.

- Vocation and activity data for the past 2 years (unless noted otherwise).
  - Vocation(s) – the types of goods typically transported.
  - Estimated percentage of annual VMT in:
    - Bay Area trade corridor.
    - Central Valley trade corridor.
    - Los Angeles/Inland Empire trade corridor.
    - San Diego/Border trade corridor.
  - For concrete mixer trucks, dump trucks, bulk blower trucks, and other truck types specifically identified by ARB staff, the owner may provide the Power Take Off (PTO) hours in conjunction with VMT:
    - Documentation from the hour meter unit is required. Include information that verifies whether or not PTO hours are accumulated independently of VMT.
    - PTO hours will be converted to miles based on a factor of 20 miles for every hour. These converted miles may then be combined with VMT in the calculation of emission reductions and cost-effectiveness if the local agency determines PTO hours are accumulated independently of VMT.
    - Where PTO hours and VMT are not accumulated independently, the local agency may use either PTO hours or VMT.

Additional documentation may be requested by the local agency.

b) Truck electrification infrastructure

- Location and description of facility where truck electrification infrastructure is proposed for installation.
- Quantification of current annual truck operations and truck refrigeration unit (TRU) operations at the facility.
- Baseline emissions (without the project) for first 10 years of operation of proposed truck electrification infrastructure (developed with the concurrence of the local agency) – this emission estimate shall fully reflect the benefits of all adopted regulations including ARB rules for trucks, idling, auxiliary power systems, TRUs, and TRUs with generators sets.
- Written project acknowledgement from the site owner (if the applicant does not own the site where the equipment will be installed) which acknowledges/agrees to the following, at a minimum, for the duration of the project life:
  - The equipment owner will be allowed to install and operate the Program-funded equipment at the site address.
  - Program-funded equipment will be the property of the applicant listed in the equipment project application.
  - The local agency, ARB, or their designees will be allowed to access the site, equipment, and associated records for inspections or audits.

Additional documentation may be requested by the local agency.

3. Proposed equipment project information

a) Option (1): Repower

- Engine repower data.
  - Engine make, engine model, and engine year.
  - Engine fuel type.
  - Specify 90% or 100% future operation in California
- Repower documentation.
  - Documentation of all engine/truck modifications planned as part of the repower project. Include description of upgrades to such things as exhaust systems, electronics, etc.
- Itemized cost information for eligible expenses (verifiable quote).
- Equipment project funding demonstration.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Documentation of match funding availability, if requested by the local agency.

b) Option (2): Replacement

- New truck data.
  - Original manufacturer's GVWR.
  - Engine model year.
  - Engine fuel type.
  - Specify 90% or 100% future operation in California
- Equipment project funding demonstration.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Documentation of match funding availability, if requested by the local agency.

c) Option (3): Three-way truck transaction

- Truck A (retrofitted truck) data.
  - Engine model year
  - ARB-verified retrofit device manufacturer and name of device.
- Truck B (scrapped truck) data.
  - Engine model year
  - Equipment owner name (if different from Truck A).
  - TRUCRS ID Number
  - Mailing address
  - Primary contact name and phone number
- Truck C (new truck) Data
  - Original manufacturer's gross vehicle weight rating (GVWR).
  - Engine model year.
  - Engine fuel type.
  - Specify 90% or 100% future operation in California

- Equipment project funding demonstration.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Documentation of match funding availability, if requested by the local agency.

d) Option (4): Truck electrification infrastructure

- Truck electrification infrastructure information.
  - Project description and design, including number and location of electrification units to be installed, with individual and total power requirements.
  - Equipment vendor(s).
  - Itemized cost information by phase (design, environmental, construction).
- Predicted activity data with new equipment.
  - Estimated annual truck connections to electric power and average connection time.
  - Estimated annual TRU connections to electrical power and average connection time.
  - Expected power usage for trucks and TRUs (separately), each year for the first 10 years of operation.
- Projected emissions and benefits of the project.
  - Emissions with the project over a 10-year period.
  - Emission reductions attributable to the project (beyond those required by law or regulation) for a 10-year period beginning in the first year of operation.
  - Demonstration that the weighted emission reductions per State dollar invested is equal or better than 0.10 pounds per State dollar.
- Equipment project funding demonstration.
  - Program dollars requested.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Total project cost (Program dollars requested plus other match funding).
  - Documentation of match funding availability. Equipment owner can provide match funding documentation after the time of application, if requested to do so by the local agency.

D. Scrap Requirements

In addition to the general scrappage requirements listed in Chapter IV.A.14., specific requirements for repower, replacement, and three-way truck transaction projects are shown in Table A.1 below.

Table A.1 Truck Equipment Project Scrap Requirements

Source Category	Equipment Project Option	Additional Requirements
Heavy Duty Diesel Trucks	Option (1) Repower	• The local agency shall ensure the impound and transport of the old engine to the licensed dismantler up to 30 calendar days after the new engine is placed into operation. • The licensed dismantler must dismantle and destroy the old engine within 60 calendar days of receipt. The engine destruction must be done in accordance with these Guidelines. • The engine block shall be punctured and destroyed in such a manner to eliminate the possibility of future operation and use of any components. • The licensed dismantler shall provide proof of scrappage to the local agency within 10 calendar days of the destruction of the engine. • The local agency or its designee must provide digital photographs, described below, showing the destruction of the old engine. The local agency must receive these photos within 10 calendar days of the destruction of the engine. • The following digital photos must be taken and labeled for the project file: 1. Engine tag with serial number. 2. Destroyed engine block.

Table A.1 Truck Equipment Project Scrap Requirements (cont.)

Source Category	Equipment Project Option	Additional Requirements
Heavy Duty Diesel Trucks	Option (2) Replacement	In addition to the requirements listed above for engine repower projects, replacement projects require: • The local agency shall ensure the impound and transport of the old truck(s) to the dismantler up to 30 calendar days after the replacement vehicle is placed into operation. • The licensed dismantler must dismantle and destroy the old truck(s) within 60 calendar days of receipt. The destruction must be done in accordance with these Guidelines. • Sever the old vehicle frame rails to ensure that the vehicle is rendered useless and to prevent repeated use. • The following digital photos must be taken and labeled for the project file: 1. Engine tag with serial number. 2. Destroyed engine block either inside or outside truck body. 3. Vehicle Identification Number printed by manufacturer inside cab. 4. Truck view from front angle capturing entire truck with readable license plate. • The equipment owner or licensed dismantler must file a VIN hold with DMV, and submit either REG 488C "Non-Repairable Vehicle Certificate" or REG 42 "Notice to Dismantler," to DMV, and submit a copy to the local agency at the time of the post-inspection. Any additional substitute documentation must be verified by ARB to ensure that the scrapped equipment is permanently removed from service. • The licensed dismantler shall provide proof of scrappage to the local agency within 10 calendar days of the destruction of the vehicle.
	Option (3) Three-Way Truck Transaction	• Truck B (old truck) must be scrapped in accordance with the equipment project scrap requirements listed in Option (2).

E. Post-Inspection

- For truck replacement equipment projects, the post-inspection shall occur within 60 calendar days after the old truck(s) is delivered to a certified dismantler.

- For truck stop/distribution equipment projects, the post-inspection shall occur within 60 calendar days after the equipment is fully operational.

Table A.2 Truck Equipment Post-Inspection Requirements

Source Category	Equipment Project Option	Additional Requirements
Heavy Duty Diesel Trucks	Option (1) Repower	• Name, address, and telephone number of company(s) that installed the new engine. • Engine make and model year. • Engine family name and number. • Engine serial number. • Date the new engine was installed. • If not in the application file, copy of ARB Executive Order documenting that the new engine meets 2010 emissions. The ARB Executive order supersedes the engine tag in case of conflict in the emission levels shown.
	Options (2) & (3) Replacement and Three-way Truck Transaction	• Vehicle type. • VIN. • Vehicle make. • Fuel type. • Vehicle license plate number (for a new vehicle, provide an invoice including the cost of tax and license fees indicating the intent to register with the DMV). The owner shall provide license plate number upon receipt from the DMV. • CA Highway Patrol number. • Engine make and model year. • Engine family name and number. • If not in the application file, copy of ARB Executive Order documenting that the replacement truck engine meets 2010 emissions. The ARB Executive order supersedes the engine tag in case of conflict in the emission levels shown.

Table A.2 Truck Equipment Post-Inspection Requirements (cont.)

Source Category	Equipment Project Option	Additional Requirements
Heavy Duty Diesel Trucks	Option (4) Truck Electrification Infrastructure	• Name of power system manufacturer. • Serial number and date of manufacture. • Rated amperage/voltage. • Verification that each project's pedestal and/or external air conditioning/power system is operational. • Inspection shall include verification of operation by connecting heavy duty truck cab and/or transport refrigeration unit (as appropriate) to a random number of pedestals or external air conditioning/power system. • Inspections: o An initial inspection shall be completed within 60 calendar days of installed and fully operational equipment. ▪ The initial inspection shall include a review of equipment owner's procedures to collect use data for first year of operation. o A second inspection (which corresponds to the proper post-inspection) shall be completed within 60 calendar days of owner completion of first year of operation. ▪ Reimbursement of equipment costs can only be requested after obtaining a satisfactory second inspection.

F. Recordkeeping Requirements

Equipment owners shall retain, at a minimum, all documents, invoices, and correspondence associated with the application award, contract, purchase, installation, equipment operation (and if applicable, registration, insurance, and warranty), and reporting for at least 2 years after the end of the equipment project contact term or 3 years after final payment, whichever is later. Records shall be readily available and accessible to the local agency, ARB, or ARB designee upon request for the purposes of ongoing evaluations or audits.

G. Annual Reporting Requirements

1. Heavy duty diesel trucks

Equipment owners shall be responsible for annual reporting to the local agency. The equipment owner shall submit annual reports for the equipment project life. The equipment owner's annual report shall include, but is not limited to:

- Contact information (owner name, address, phone, etc.).
- Proof of current California registration.
- Fleet size.
- Current odometer reading, including the date read (estimate total vehicle mileage if odometer is missing or broken).
- Certification of annual California VMT since last report.
- Certification of the required 90 percent California or 100 percent California-only operation.
- Certification of at least 50 percent of travel within the four California trade corridors as well as provide the percentage of annual VMT in the following:
    - Bay Area trade corridor.
    - Central Valley trade corridor.
    - Los Angeles/Inland Empire trade corridor.
    - San Diego/Border trade corridor.
- Certification of insurance.
- Certification that the bond-funded project was operated in accordance with the signed contract, and that all information submitted is true and accurate.
- Documentation of the number of port/railyard visits within 12 month period. Local agencies may use alternate methods to verify the port/railyard visits including, but not limited to gate activity information from ports. This reporting requirement applies only to trucks serving ports and intermodal railyards receiving FY2007-08 (Year 1) funding.
- Other information as requested by the local agency.

2. Truck electrification infrastructure

Equipment owners shall be responsible for annual reporting to the local agency. The equipment owner shall submit annual reports for the equipment project life. The equipment owner reports shall include, but are not limited to:

- Contact information (owner name, company, address, phone).
- Facility location.
- Project completion date.
- Actual number of truck and TRU connections to equipment per unit (parking space) each month in the reporting period.

- Actual number of hours the equipment was used per unit (parking space) each month in the reporting period. Include only equipment hours that enabled usage of heating and cooling to the cab or electrical power to TRUs or auxiliary power systems.
- Actual electrical usage by trucks or equipment documented by electric utility billing statements, electric meter readings, equipment monitoring data or other approved method in the reporting period. Include only electrical power that enabled usage of heating and cooling to the cab or electrical power to TRUs or auxiliary power systems.
- Date, duration, and general description of any equipment failure or other event that prevented trucks from using the system for more than 1 week.
- Certification of insurance.
- Signed certification statement that the bond-funded project was installed and is operating as it was approved in the post-inspection and that all information submitted to the local agency is true and accurate.
- Other information as requested by the local agency.

In addition to annual reporting, the equipment owner shall be responsible for quarterly reporting of the above items to the local agency during the first year of operation. Quarterly reports must include **monthly** equipment connections, monthly operational hours, and electricity usage during the reporting period.

APPENDIX B Locomotives and Railyards

A. Equipment Project Specifications

Eligible Equipment	**Locomotive projects**: Diesel-powered freight locomotives with no or minimal emissions control technology (i.e., uncontrolled, or meeting Tier 0 through Tier 2 standards). Equipment owner must demonstrate: • Operation or equivalent locomotive horsepower operation in California for the past 2 years. • At least 50% operation or equivalent locomotive horsepower operation within the four California trade corridors for the past 2 years. • Estimated diesel fuel usage of 20,000 gallons or equivalent per year or greater. **Locomotive emissions capture and control system projects**: Existing freight railyards within the four California trade corridors.
General Requirements (applicable to all project options)	Equipment owner shall: • Commit to the project life specified with the applicable equipment project option. • Adhere to all Program requirements during the project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and insurance on upgraded equipment. • Certify that there are no outstanding ARB violations or non-compliance with ARB regulations associated with the equipment or the owner. • Exclude any Program-funded equipment from the compliance calculations for the 1998 agreement for locomotives operating in the South Coast Air Basin for the duration of the project life (applicable to Union Pacific and BNSF Railway only).

Locomotives and Railyards (cont.)

Option (1): Switcher Locomotive (1,006 hp - 2,300 hp)	Partial funding (see options below) to replace, repower, or rebuild an uncontrolled, Tier 0 through Tier 1+ switcher locomotive with a new engine or alternative technology that meets U.S. EPA Tier 4 or lower emission standards (1.30 grams per brake horsepower-hour (g/bhp-hr) or lower NOx and 0.03 g/bhp-hr or lower PM).
Funding Options	1. The lower of 60% of the eligible cost or $1,800,000/locomotive if operational by December 31, 2015. 2. The lower of 50% of the eligible cost or $1,500,000/locomotive if operational on January 1, 2016 or later. Eligible costs may include a new chassis, freshly manufactured engine(s), diesel PM filter, diesel oxidation catalyst, exhaust gas recirculation, selective catalytic reduction device for NOx control, and mechanical/electrical systems components necessary for safe operation. Ineligible costs include auto start/stop devices required by regulation or agreements, GPS devices and associated monitoring and reporting costs, design, engineering, consulting, license, registration, taxes, insurance, operation, maintenance, and repair.
Requirements	The new or upgraded equipment must meet the required emission levels or standards as evidenced by a U.S. EPA Certificate of Conformity (if available) and an ARB Verification Letter of the emission levels achieved. In addition to the General Requirements, equipment owner shall: • Commit to 90% or 100% operation within the four California trade corridors for the duration of the project life and be permitted to have equipment temporarily travel out-of-state for periodic maintenance, if outlined in the contract between the local agency and equipment owner. • Commit to a project life of 15 years. • Scrap old engine/locomotive, or ban old engine/locomotive from California operation. • Install an active GPS device on both old (if not scrapped) and new equipment, fund data collection, and report location data.

Locomotives and Railyards (cont.)

Option (2): (Medium Horsepower) Locomotive (2,301 hp - 4,000 hp)	Partial funding (see options below) to replace, repower, or rebuild an uncontrolled, Tier 0 through Tier 1+ medium horsepower locomotive with a new engine or alternative technology that meets U.S. EPA Tier 4 or lower emission standards (1.30 g/bhp-hr or lower NOx and 0.03 g/bhp-hr or lower PM).
Funding Options	1. The lower of 60% of the eligible cost or $1,800,000/locomotive if operational by December 31, 2015. 2. The lower of 50% of the eligible cost or $1,500,000/locomotive if operational on January 1, 2016 or later. Eligible costs may include a new chassis, freshly manufactured or rebuilt engine(s), diesel PM filter, diesel oxidation catalyst, exhaust gas recirculation, selective catalytic reduction device for NOx control, other emission control equipment, and new or upgraded mechanical/electrical/control system components necessary for safe operation. Ineligible costs include auto start/stop devices required by regulation or agreements, GPS devices and associated monitoring and reporting costs, design, engineering, consulting, license, registration, taxes, insurance, operation, maintenance, and repair.
Requirements	The new or upgraded equipment must meet the required emission levels or standards as evidenced by a U.S. EPA Certificate of Conformity (if available) and an ARB Verification Letter of the emission levels achieved. In addition to the General Requirements listed previously, equipment owner shall: • Commit to 90% California or 100% California-only operation for the duration of the project life and be permitted to have equipment temporarily travel out-of-state for periodic maintenance, if outlined in the contract between the local agency and equipment owner. • Commit to at least 50% of operation within the four California trade corridors for duration of the project life. • Commit to a project life of 15 years. • Commit to the funded locomotive using only California ARB diesel fuel. • Scrap or ban old engine/locomotive from California operation. • Install an active GPS device on both old (if not scrapped) and new equipment, fund data collection, and report location data.

Locomotives and Railyards (cont.)

Option (3): Line-Haul Locomotive (4,001 hp or higher)	Partial funding (see options below) to replace, repower, or rebuild an uncontrolled, Tier 0 through Tier 2 line-haul locomotive with a new engine or alternative technology that meets U.S. EPA Tier 4 or lower emission standards (1.30 g/bhp-hr or lower NOx and 0.03 g/bhp-hr or lower PM).
Funding Options	1. The lower of 70% of the eligible cost or $2,100,000/locomotive if operational by December 31, 2015. 2. The lower of 60% of the eligible cost or $1,800,000/locomotive if operational on January 1, 2016 or later. Eligible costs may include a new chassis, freshly manufactured or rebuilt engine(s), new generator set(s), diesel PM filter, diesel oxidation catalyst, exhaust gas recirculation, selective catalytic reduction device for NOx control, other emission control equipment, and new or upgraded mechanical/electrical/control system components necessary for safe operation. Ineligible costs include auto start/stop devices required by regulation or agreements, GPS devices and associated monitoring and reporting costs, design, engineering, consulting, license, registration, taxes, insurance, operation, maintenance, and repair.
Requirements	The new or upgraded equipment must meet the required emission standards as evidenced by a U.S. EPA Certificate of Conformity (if available) and an ARB Verification Letter of the emission levels achieved. In addition to the General Requirements listed previously, equipment owner shall: • Commit to 90% California or 100% California-only operation for the duration of the project life and be permitted to have equipment temporarily travel out-of-state for periodic maintenance, if outlined in the contract between the local agency and equipment owner. • Commit to at least 50% of operation within the four California trade corridors for the duration of the project life. • Commit to a project life of 15 years. • Commit to the funded locomotive only using California ARB diesel fuel. • Scrap or ban old (Tier 0 through Tier 1+) engine/locomotive from California operation. • If upgrading a Tier 2 engine/locomotive, the Tier 2 equipment may remain in California and a Tier 0 through Tier 1+ engine/locomotive be scrapped or banned from California operation. • Install an active GPS device on both old (if not scrapped) and new equipment, fund data collection, and report location data.

Locomotives and Railyards (cont.)

Option (4): Locomotive Emissions Capture and Control System	Partial funding for the lower of 50% of eligible costs or a level commensurate with a cost-effectiveness of at least 0.15 pounds of weighted emissions reduced per State dollar invested for the purchase and installation of an ARB-approved locomotive emission capture and control system (a.k.a. hood or bonnet) to reduce diesel PM and NOx emissions from freight locomotives. Eligible costs may include purchase and installation of the emission treatment system and ducting, and hoods or bonnets necessary to connect to locomotives. Ineligible costs may include those associated with increasing the capacity of electrical power to the facility, locomotive modifications to accept capture and control system, locomotive or other acquisition and modification for a portable system, design, engineering, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, utility construction or metered costs, insurance, operation, maintenance, and repair.
Requirements	In addition to the General Requirements listed previously, equipment owner shall: • Commit to 100% operation within the four California trade corridors for the duration of the project life. • Commit to a project life of 10 years. • Document the system is commercially available and achieves an overall capture and control efficiency rate of at least 85% for the removal of NOx and PM. • Demonstrate system performance and efficiency with source testing prior to funding and annually thereafter by capturing emissions from an operating locomotive undergoing diagnostic procedures. Performance measures include: (i) no visible emissions after bonnet is connected to the locomotive (opacity <20%); and (ii) establish overall system efficiency rate is at least 85% using ARB approved methods for flow rate (Methods 1 to 4), NOx (ARB Method 100) and PM (ARB Method 5). Any alternative test methods must be approved by ARB. • Obtain a 10-year manufacturer's warranty (including labor and materials) to repair and/or replace system component(s) as needed to correct any mechanical, electrical or control system equipment or installation problems which may cause significant loss of capture, treatment efficiency or usability. The manufacturer's warranty may exclude minor items that are subject to normal wear and tear if approved by ARB. • Comply with all local permitting requirements.
Excluded Funding Components	• Electricity costs required to operate the hood control system. • Other operation and maintenance costs.
Project Cost Assumptions	• Estimated total cost of a Tier 4 switcher, medium horsepower, or line-haul locomotive is ~$2-$3 million (repower and new, respectively). • Estimated capital cost for the locomotive emissions capture and control system of one 12,500 scfm unit with 12 bonnets is ~$9 million.

B. Major Milestones for Project Completion

- Equipment order.
- Equipment acquisition/installation.
- Submittal of invoice to local agency for reimbursement.

C. Application Information

- Equipment owners shall provide the following information and documentation in addition to the requirements described in Chapter VI., and other information ARB or local agencies may request on the equipment project applications.
- Union Pacific and BNSF Railway must certify that any locomotive that would operate in the South Coast Air Basin will be excluded from the railroads fleet average emissions calculations under the 1998 agreement.

1. General information

This section applies to all equipment project options.

- Organization/agency/company name.
- Railroad Class (1, 2, or 3).
- Mailing address.
- Primary contact name and phone number.
- Person with equipment contract signing authority (owner).
- Proof of identity of equipment owner.
- Business information.
    - Number of locomotives.
    - Number of employees.

2. Current equipment and activity information

a) Switcher, medium horsepower, and line-haul locomotive

- Existing locomotive information.
    - Locomotive type (diesel/electric, alternative technology).
    - Build number and build date.
    - Builder.
    - Locomotive make, model, and serial number.

  - Engine data (per engine).
    - Engine configurations (roots blown, turbo-charged, other).
    - Emission control level (uncontrolled, Tier 0 through Tier 2).
    - Engine family, make and type, model and engine year.
    - Serial number.
    - Horsepower.
    - Number of cylinders.
    - Fuel type.
  - Electronic monitoring unit device type and model (if equipped).
- Ownership.
  - Documentation of current ownership.
- Activity data for the past 2 years (for existing unit or units of comparable horsepower and function).
  - Annual fuel consumption (gallons of fuel) or annual megawatt hours of operation.
  - Name and location of home railyard.
- Activity documentation for past 2 years (for existing unit or units of comparable horsepower and function).
  - Documentation of at least 50 percent of operation within the four California trade corridors.
  - Identify in which of the four California trade corridors the equipment is routinely operated.
  - Documentation of fuel consumption.
  - Documentation of megawatt hours of operation.
  - ARB staff shall post on the Program website additional instructions for applicants demonstrating eligibility based on units of comparable horsepower and function.

b) Locomotive emissions and capture control system

- Facility location.
  - Address of railyard where technology will be installed.
  - Description and area map of railyard facility where system is proposed for installation.
- Railyard activity.
  - Quantification of current annual locomotive maintenance and diagnostic operations at the area within facility where infrastructure is proposed.
  - Number and type of units being serviced.
    - For each type of unit being serviced, provide average time spent in idling and on each notch level while being serviced or in diagnostics.
- Baseline emissions (without the project in place) for the 10 years of operation of the system. This baseline should reflect the benefits of all adopted regulations, MOU agreements, and any other enforceable agreements.

Additional documentation may be requested by the local agency.

3. Proposed equipment project information

a) Switcher locomotive

- New switcher data.
  - Locomotive type (diesel-electric, gen-set, alternative technology).
  - Builder name.
  - Locomotive make.
  - Locomotive family name.
  - U.S. EPA Certificate of Conformity (if available) and an ARB Verification Letter of the emission levels achieved.
  - Engine data (per engine).
    - Engine configurations (roots blown, turbo-charged, other).
    - Engine family, make, and engine year.
    - Horsepower.
    - Number of cylinders.
    - For new switcher gen-sets, provide the number of engines, and each engine horsepower and kilowatts-hour.
    - Fuel type.
  - Emission control equipment installed (i.e., diesel PM filter, diesel oxidation catalyst, exhaust gas recirculation, selective catalytic reduction, etc.).
  - Electronic monitoring device unit type and a description or sample of the type/format of reportable data.
- Itemized cost information for eligible expenses.
  - Locomotive, engine, or generator set (as applicable).
  - Emission control equipment (as applicable).
  - Other equipment/materials.
- Predicted activity data with new equipment.
  - Specify 100 percent future operation in the four California trade corridors.
  - Estimated annual fuel consumption (gallons of fuel) or estimated annual megawatt hours of operation (as applicable).
  - Name and location of home railyard.
- Equipment project funding demonstration.
  - Program funds requested.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Total project cost (Program funds requested plus other match funding).
  - Documentation of match funding availability.

b) Medium horsepower and line-haul locomotive

- New locomotive or engine data.
  - Locomotive type (diesel-electric, gen-set, alternative technology).
  - Builder name.
  - Locomotive make.
  - U.S. EPA Certificate of Conformity (if available) and an ARB Verification Letter of the emission levels achieved.

  - Engine data (per engine).
    - Engine configurations (roots blown, turbo-charged, other).
    - Engine family, make, and engine year.
    - Horsepower.
    - Number of cylinders.
    - For new gen-sets, provide the number of engines and each engine horsepower and kilowatts-hour.
    - Fuel type.
  - Emission control equipment installed (diesel PM filter, diesel oxidation catalyst, exhaust gas recirculation, selective catalytic reduction, etc.).
  - Electronic monitoring device unit type and a description or sample of the type/format of reportable data.
- Itemized cost information for eligible expenses.
  - Locomotive or engine (as applicable).
  - Emission control equipment (as applicable).
  - Other equipment/materials.
- Predicted activity data with new equipment.
  - Specify 90 percent or 100 percent future operation California.
  - Estimated annual fuel consumption (gallons of fuel) or estimated annual megawatt hours of operation (as applicable).
  - Name and location of home railyard.
- Equipment project funding demonstration.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Total project cost (Program funds requested plus other match funding).
  - Documentation of match funding availability.

c) Locomotive emissions capture and control system

- Project description and design, including:
  - Number of emissions capture systems (bonnets) per unit.
  - Number of emissions treatment systems.
  - Support structure.
  - Emissions overhead manifold.
- Emission control equipment data.
  - Equipment vendor(s).
  - Documentation of percent PM and NOx emission reductions.
- Itemized cost for each eligible expense.
- Predicted locomotive activity data with new system over project life.
  - Number and type of locomotive units using the hood.
  - Average time locomotives will spend under the hood idling and in notches 1-8 for each unit type identified above.
  - Power usage to run the system and source of power (grid- vs. non-grid-based).
  - Natural gas usage (if any) for heating selective catalytic reduction duct burner.

- Projected emissions and benefits with the project.
  - Emissions with the project over 10 years of operation.
  - Emission reductions attributable to the project (beyond those required by any law, regulation, or enforceable agreements) for 10 years.
  - Demonstration that the weighted emission reductions are equal to or higher than 0.15 pounds per State dollar invested.
- Equipment project funding demonstration.
  - Total project cost.
  - Program funds requested.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Documentation of match funding availability.

D. Scrap Requirements

In addition to the general scrappage requirements described in Chapter IV.A.14., specific requirements for locomotive repower and replacement projects are shown in Table B.1 below.

Table B.1 Locomotive Equipment Project Scrap Requirements

Source Category	Equipment Project Option	Additional Requirements
Locomotives	Project Options (1), (2), or (3) Repower or Replacement	• The local agency shall ensure the impound and transport of the old engine(s) to the licensed dismantler up to 30 days after the new engine(s) being placed into operation. • The licensed dismantler must dismantle and destroy the old engine(s) within 60 days of receipt. The engine destruction must be done in accordance with these Guidelines. • The engine block shall be punctured and destroyed in such a manner to eliminate the possibility of future operation. • The licensed dismantler shall provide proof of scrappage to the local agency within 10 days of the destruction of the engine. • The local agency or its designee must provide digital photographs, described below, showing the destruction of the old engine. The local agency must receive these photos within 10 days of the destruction of the engine. • The following digital photos must be taken and labeled for the project file: o Engine serial number either stamped on the block or on the tag. o Destroyed engine block.

E. Alternative to Scrapping

If the equipment owner has elected to ban the old locomotive or locomotive engine from future operations in California, the equipment owner shall demonstrate to the local agency's satisfaction that the following requirements are met for the duration of the contract:

- An active GPS device has been installed in the old equipment.
- The GPS device is fully operational and can be easily tracked.
- Provide local agency the GPS manufacturer's name, date of manufacture, and serial number of device.
- If old engine or old locomotive is remanufactured, equipment owner must provide remanufacturing date, remanufacturer's name, and sufficient information to identify remanufactured engine and (if applicable) remanufactured locomotive, including changes to emissions levels.
- If old equipment is sold, new owner must assume GPS tracking and reporting responsibilities.
- Data collection is fully funded by equipment owner.
- Report old unit future locations to local agency in the manner indicated in contract.

The old equipment, equipped with the GPS device, shall be removed from California within 60 days of receiving the fully operational upgraded equipment.

F. Post-Inspection

In addition to the general post-inspection requirements described in Chapter IV.A.16., specific requirements for locomotive post-inspections are shown in Table B.2 below.

For locomotive projects, the post-inspection shall occur within 60 days of owner receipt of fully operational equipment.

Table B.2 Locomotive Equipment Post-Inspection Requirements

Source Category	Equipment Project Option	Additional Requirements
Locomotives	Option (1), (2), and (3) Switcher, Medium Horsepower, and Line-Haul	• Locomotive engine must be operated under its own power under loaded conditions. • Engine make, model, engine year, and serial number for repower and replacement projects. • Start and end dates of when locomotive was repowered. • Name and address of company that repowered the locomotive engine.
	Option (4) Locomotive Emissions Capture and Control System	• Verify that source testing demonstrates the required capture and control efficiency. • The fully operational system must be connected to an operating locomotive and complying with performance measures stated in the specification.

G. Recordkeeping Requirements

Equipment owners shall retain, at a minimum, all documents, invoices, and correspondence associated with the application, award, contract, purchase, installation, equipment operation (and if applicable, registration, insurance, and warranty), and reporting for at least 2 years after the end of the equipment project contact term or 3 years after final payment, whichever is later. Records shall be readily available and accessible to the local agency, ARB, or ARB designee upon request for the purposes of ongoing evaluations or audits.

H. Annual Reporting Requirements

Equipment owners shall be responsible for annual reporting to the local agency that includes, but is not limited to:

1. Switcher, medium horsepower, and line-haul locomotive

- Contact information (owner name, company, address, phone).
- Build number, date, builder, builder model.
- Date of equipment installation.
- Locomotive type.
- Name and location of home railyard.
- Annual megawatt-hours of operation, and fuel consumed since last report.
- Representative profile data to determine engine duty cycle.
- Certification and documentation of 90 percent or 100 percent operation in the four California trade corridors for switcher locomotives.
- Certification of 90 percent California or 100 percent California-only operation for medium horsepower and line-haul locomotives.
- Certification and documentation of 50 percent operation in the four California trade corridors for medium horsepower and line-haul locomotives.
- Summary of maintenance performed (including location) and inspections conducted.
- GPS data in a usable format.
- The percentage of annual travel in each of the four California trade corridors:
    - Bay Area trade corridor.
    - Central Valley trade corridor.
    - Los Angeles/Inland Empire trade corridor.
    - San Diego trade corridor.
- Certification that the bond-funded project was used in accordance with the signed contract and that all information submitted is true and accurate.
- Other information as requested by ARB or the local agency.

2. Locomotive emissions capture and control system

- Contact information (owner name, company, address, phone).
- Description of locomotive emissions capture and control system.
- Railyard name/identifier.
- Date and location of equipment installation.
- Total hours the equipment operated while connected to an operating locomotive over the reporting period.
- Total number of locomotives connected to the system over the reporting period.
- Estimated average locomotive engine size (in horsepower) connected to the system.
- Power usage to run the hood and source of power (grid or generator).
- Natural gas usage (if any) for heating selective catalytic reduction duct burner.
- Summary of maintenance, source testing and inspections conducted.
- Signed certification statement that the bond-funded project was operated in accordance with signed contract and that all information submitted is true and accurate.
- Other information as requested by the local agency or ARB.

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APPENDIX C Ships at Berth

A. Equipment Project Specifications

Eligible Equipment	Existing cargo ship berth or existing cargo ship terminal at a seaport located within the four California trade corridors that does **not** receive visits by vessels (e.g., container ships, reefers, and cruise ships) subject to ARB's Ships at Berth Rule.

General Requirements (applicable to all project options)	Equipment owner shall:
	• Commit to the project life specified with the applicable equipment project option.
	• Have written commitments from the tenant shipping line(s) to:
	  o Meet the minimum number of ship visits or hours.
	  o Sign the equipment project contract (or other written agreement as approved by ARB).
	• Adhere to all Program requirements during the project life.
	• Comply with record-keeping, reporting, and audit requirements.
	• Sign a legally binding contract with the local agency and the port, including project milestone and completion deadlines.
	• If the equipment owner is also the local agency administering the grant, the local agency must sign a legally binding contract with ARB including project milestone and completion deadlines.
	• Properly maintain all equipment in good operating condition and according to manufacturer's recommendations.
	• Demonstrate proof of equipment warranty and insurance on new equipment.
	• Comply with local permitting requirements.
	• Comply with the Supplemental Procedures available on the Program website.
	• Certify that there are no outstanding ARB violations or non-compliance with ARB regulations associated with the equipment or the owner.

Option (1) Grid-Based Power	Partial funding (see options below) to install permanent, grid-based electrical power at a cargo ship berth that does **not** receive visits by vessels (e.g., container ships, reefers, and cruise ships) subject to ARB's Ships at Berth Rule. Project shall be eligible to compete for funding only if the cost-effectiveness is equal or greater than 0.10 pounds of weighted emissions reduced per State dollar invested. 1. The lower of 50% of the eligible cost or $2,500,000 if the cost-effectiveness is equal or greater than 0.10 pounds of weighted emissions reduced per State dollar invested. 2. The lower of 60% of the eligible cost or $3,500,000 if the cost-effectiveness is equal or greater than 0.20 pounds of weighted emissions reduced per State dollar invested. Up to 80% of eligible project costs are authorized for early reimbursement in accordance with the requirements of Chapter IV.B.2.e. Final payment of funds held in retention shall be paid upon completion of a satisfactory post-inspection. Eligible costs may include design, engineering, equipment necessary to purchase and install infrastructure to supply electrical power, utility construction, and costs associated with increasing the capacity of electrical power to the port. Ineligible costs include shipside modifications to accept shore-based electrical power, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, metered costs, insurance, operation, maintenance, and repair.
Requirements	In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of 10 years. • Demonstrate operability with a cargo ship fully powered by shore-based electrical power supplied by the grid-based equipment.

Ships at Berth (cont.)

Option (2) Non-Grid-Based Power	Partial funding of up to $200,000 per megawatt of the eligible costs of an electricity generating unit that provides power at a cargo ship berth or multiple berths that do **not** receive visits by vessels (e.g., container ships, reefers, and cruise ships) subject to ARB's Ships at Berth Rule. This unit can be portable or fixed on the terminal. Only zero emission units (e.g., fuel cell, solar), or natural gas engines equipped with selective catalytic reduction to control NOx emissions are eligible. Eligible costs may include equipment necessary to generate electrical power and connect the equipment to cargo ships at berth. Ineligible costs include construction and protection of infrastructure (e.g., natural gas lines) used to supply fuel for non-grid-based electrical generation, shipside modifications to accept electrical power, barge or other acquisition and modification for a portable system, design, engineering, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, utility construction or metered costs, insurance, operation, maintenance, and repair.

Requirements	In addition to the General Requirements listed previously, equipment owner shall:
	• Commit to a project life of 5 years of 100% California operation at the following levels or greater:
	  ○ Port of Los Angeles and Port of Long Beach:
	  ▪ 1,500 hours per year.
	  ○ All other ports within the four California trade corridors:
	  ▪ 1,000 hours per year.
	• Demonstrate operability with a cargo ship fully powered by shore-based electrical power supplied by the electricity generating unit.
	• Obtain a 5 year manufacturer's warranty which includes labor and materials to repair and/or replace system component(s) as needed to correct any mechanical, electrical or control system equipment or installation problems resulting in significant loss of usability. The manufacturer's warranty may exclude minor items that are subject to normal wear and tear if approved by ARB.
	• Perform source testing to measure emissions from the unit every 1,000 hours of operation, according to the source test requirements contained in ARB's Ships at Berth Rule.

Ships at Berth (cont.)

Option (3) Ship Emissions Capture and Control System	Partial funding of up to the lower of 50% of the eligible costs or a level commensurate with a cost-effectiveness of at least 0.15 pounds of weighted emissions reduced per State dollar invested for the purchase and installation of a ship emissions capture and control system (a.k.a. hood or bonnet) to reduce diesel PM and NOx emissions at 85% from ships at berths that do **not** receive visits by vessels (e.g., container ships, reefers, and cruise ships) subject to ARB's Ships at Berth Rule. Only units that have ARB-approved capture and treatment efficiency rates for PM and NOx consistent with ARB's Ships at Berth Rule are eligible for funding.

Requirements	Eligible costs may include purchase and installation of the emission treatment system and ducting, and hoods or bonnets necessary to connect to cargo ships at berth.
	
	Ineligible costs include shipside modifications to accept capture and control system, barge or other acquisition and modification for a portable system, design, engineering, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, utility construction or metered costs, insurance, operation, maintenance, and repair.
	
	In addition to the General Requirements listed previously, equipment owner shall:
	• Commit to a project life of 10 years of 100% California operation at the following levels or greater:
	  o Port of Los Angeles and Port of Long Beach:
	  ▪ 1,500 hours per year.
	  o All other ports within the four California trade corridors:
	  ▪ 1,000 hours per year.
	• Commit to 100% operation within the four California trade corridors for the duration of the project life.
	• Document the system is commercially available and achieves an overall efficiency rate of at least 85% for the capture and removal of NOx and PM.
	• Demonstrate system performance and efficiency with source testing prior to funding and annually thereafter by capturing emissions from a cargo ship at port. Performance measures include: (i) no visible emissions after bonnet is connected to the locomotive (opacity <20%); and (ii) establish overall system efficiency rate is at least 85% using ARB approved methods for flow rate (Methods 1 to 4), NOx (ARB Method 100), and PM (ARB Method 5). Any alternative test methods must be approved by ARB.
	• Obtain a 10 year manufacturer's warranty (including labor and materials) to repair and/or replace system component(s) as needed to correct any mechanical, electrical or control system equipment or installation problems which may cause significant loss of capture, treatment efficiency or usability. The manufacturer's warranty may exclude minor items that are subject to normal wear and tear if approved by ARB.

Project Cost Assumptions	• Option (1): Total shore-side cost of equipping a berth with permanent grid-based electrical power is ~$3-$5 million/berth; some ports may incur higher costs to bring new/additional power capacity to the port that may increase the total cost to $5-$7 million/berth. • Option (2): Total cost of distributed generation power is anticipated to be $4 million/2 MW unit. • Options (1) & (2): Shipside modifications will cost ~$500,000-$1 million/ship. • Option (3): Ship emissions capture and control system estimated capital cost is approximately $6 million for the current standard design of one 12,500 scfm unit with single bonnet.

B. Major Milestones for Project Completion

- Preliminary design.
- Environmental clearance, if applicable.
- Final design.
- Equipment acquisition, if applicable.
- Construction bid award.
- Construction completion/equipment installation.
- Submittal of invoice to local agency for reimbursement.

C. Application Information

Equipment owners shall provide the following information and documentation in addition to the requirements described in Chapter VI., and other information ARB or local agencies may request on the equipment project applications.

1. General information

This section applies to all equipment project options.

- Organization/agency/company name.
- Mailing address.
- Primary contact name and phone number.
- Person(s) with equipment contract signing authority (owner).
- Proof of identity of equipment owner.

2. Current equipment and activity information

Not applicable

3. Proposed equipment project information

a) Grid-based shore power

- Project Information.
  - Port where the berth is located.
  - Berth name/identifier and location within port.
  - Owner and operator of berth.
  - Project description, design, maximum power demand (kWh-hr).
  - Itemized cost information by phase (e.g., design, environmental, construction).
- Berth activity data for the past 2 years.
  - Number of ship visits to the berth.

- Ship information (per ship).
  - Number of visits per year.
  - Average hotelling time per visit (hours/visit).
  - Ship type, size (e.g., twenty-foot equivalent unit (TEU) capacity), description (e.g., number of engines, fuel type), power demand (total auxiliary power (kW), net hotelling load (kW)).
- Predicted berth activity data with new equipment.
  - Total estimated annual ship visits.
  - Estimated annual ship visits using electrical power.
  - Estimated ship types, description, power demands.
  - Estimated annual hotelling hours.
  - Estimated annual MW usage.
  - Information demonstrating future visits by vessels will **not** be subject to ARB's Ships at Berth Rule.
- Equipment project funding demonstration.
  - Program funds requested.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Total project cost (Program funds requested plus other match funding).
  - Documentation of match funding availability.
- Project acknowledgement.
  - If the applicant does not own the site where the equipment will be installed, the applicant shall obtain and include a written project acknowledgement from the site owner with the application submittal or thereafter if allowed by the local agency. The project acknowledgement shall acknowledge/agree in writing, at a minimum:
    - The equipment owner will be allowed to install and operate the Program-funded equipment at the site address.
    - Program-funded equipment will be the property of the applicant listed in the equipment project application.
    - The local agency, ARB, or their designees will be allowed to access the site, equipment, and associated records for inspections or audits.
    - The project acknowledgement is valid over the entire project life.

b) Non-grid-based shore power

- Project Information.
  - Port where the berths are located.
  - Berth(s) name/identifier and location within port.
  - Owner and operator of berth.
  - Project description, design, maximum power demand (megawatts).
  - Itemized cost information for eligible expenses (verifiable quote).
- Berth activity data for the past 2 years (per berth).
  - Number of ship visits to the berth.

- Ship information (per ship).
  - Number of visits per year.
  - Average hotelling time per visit (hours/visit).
  - Ship type, size (e.g., TEU capacity), description (e.g., number of engines, fuel type), power demand (total auxiliary power (kW)), net hotelling load (kW)).
- Predicted activity data with new equipment.
  - Total estimated annual ship visits.
  - Estimated annual ship visits using electrical power.
  - Estimated ship types, description, power demands.
  - Estimated annual hotelling hours.
  - Estimated annual MW usage.
  - Information demonstrating future visits by vessels will **not** be subject to ARB's Ships at Berth Rule.
- Equipment project funding demonstration.
  - Program funds requested.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Total project cost (Program funds requested plus other match funding).
  - Documentation of match funding availability.

c) Ship emissions capture and control system

- Project description and design, including:
  - Number of emissions capture subsystems (bonnets) per unit.
  - Number of emissions treatment subsystems.
  - Support structure.
  - Any other components (ducts, etc.).
- Emission control equipment data.
  - Equipment vendor(s).
  - Documentation of percent PM and NOx emission reductions.
- Itemized cost for each eligible expense.
- Predicted ship activity data with new system over project life (per ship type).
  - Number and type of ships under the hood.
  - Average time ships will spend under the hood.
  - Power usage (kWh) to run the system and source of power (grid- vs. non-grid-based).
  - Natural gas usage (if any) for heating selective catalytic reduction duct burner.
  - Information demonstrating the equipment shall be utilized exclusively by vessels that are **not** subject to ARB's Ships at Berth Rule.
- Projected emissions and benefits with the project.
  - Emissions with and without the project over 10 years of operation.
  - Emission reductions attributable to the project (beyond those required by any law or regulation) for 10 years.
  - Demonstration that the weighted emission reductions are equal to or higher than 0.15 pounds per State dollar invested.

- Equipment project funding demonstration.
  - Total project cost.
  - Program funds requested.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Documentation of match funding availability.

D. Post Inspection

Table C.1 Ships at Berth Post-Inspection Requirements

Source Category	Equipment Project Option	Additional Requirements
Ships at Berth	Option (1) Grid-Based Shore Power	• A ship must be plugged into shore power at the designated berth, with the engines turned off, and drawing power to demonstrate to the inspector that it is in proper working order. • Verification that this project serves the intended berth(s).
	Option (2) Non-Grid-Based Shore Power	• Ship must be plugged into shore power at the designated berth, with the engines turned off, and drawing power to demonstrate to the inspector that it is in proper working order. • Verification that this project serves the intended berth(s).
	Option (3) Ship Emissions Capture and Control System	• The fully operational system must be connected to a ship and complying with performance measures stated in the specification. • Verification that this project serves the intended berth(s).

E. Recordkeeping Requirements

Equipment owners shall retain, at a minimum, all documents, invoices, and correspondence associated with the application, award, contract, purchase, installation, equipment operation (and if applicable, registration, insurance, and warranty), and reporting for at least 2 years after the end of the equipment project contact term or 3 years after final payment, whichever is later. Records shall be readily available and accessible to the local agency, ARB, or ARB designee upon request for the purposes of ongoing evaluations or audits.

F. Annual Reporting Requirements

Equipment owners shall be responsible for annual reporting to the local agency for the equipment project life. The equipment owner annual report shall include, but is not limited to:

1. Shore power (grid- and non-grid-based power)

- Contact information (owner name, company, address, phone).
- Equipment description and type providing electrical power.
- Port and berth name(s)/identifier(s).
- Date of installation of equipment.
- Vessel type, name, and Lloyd's number utilizing berth.
- Total ship visits utilizing berth.
- Ship visits utilizing Program-funded equipment.
- Documentation of Program-funded equipment's electricity usage at berth (for grid-based power).
- Power, in megawatts, supplied to the vessels (for non-grid-based power).
- Episodes of electrical service interruption by local utility company (for grid-based power).
- Date and description of any equipment failure that prevented a ship from using the shore-based power (for non-grid-based power).
- Summary of maintenance and inspections conducted.
- Signed certification statement that the bond-funded project was operated in accordance with the signed contract and that all information submitted is true and accurate.
- Project records must be retained for at least 2 years after contract expiration or 3 years after final project payment, whichever is later.
- Summary of source testing (for non-grid-based power).
- Other information as requested by the local agency.

2. Ship emissions capture and control system

- Contact information (owner name, company, address, phone).
- Description of ship emissions capture and control system.
- Port and berth name(s)/identifier(s).
- Date and location of equipment installation.
- Vessel type, name, and Lloyd's number of vessels utilizing the system.
- Total ship visits utilizing the system by berth.
- Power usage (kW-hr) to run the hood and source of power (grid- vs. non-grid-based).
- Natural gas usage (if any) for heating selective catalytic reduction duct burner.
- Date and description of any equipment failure that prevented a ship from using the system to reduce emissions.
- Summary of maintenance, source testing and inspections conducted.
- Signed certification statement that the bond-funded project was operated in accordance with signed contract and that all information submitted is true and accurate.
- Other information as requested by local agency.

APPENDIX D Commercial Harbor Craft

A. Equipment Project Specifications

Eligible Equipment	Existing commercial diesel harbor craft vessels involved in goods movement with: a home port located within the four California trade corridors, 2 years of at least 75% operation in California Coastal (and inland) Waters, Tier 0 or Tier 1 diesel engine(s) for repower or replacement projects and Tier 2 or Tier 3 diesel engine(s) for hybrid projects. Vessel upgrades must achieve a minimum cost effectiveness value of 0.10 pounds of weighted emissions reduced per State dollar invested. Eligible vessel types (as defined in section 93118.5, title 17, chapter 1, subchapter 7.5, California Code of Regulations (d) Definitions) include: • Tugboats and towboats. • Work boats. • Pilot vessels. • Commercial fishing boats.
General Requirements (applicable to all project options)	Equipment owner shall: • Commit to 8 years of California home port operation within the four California trade corridors. • Commit to 100% operation within California Coastal (and inland) Waters (or 90% if that option has been selected). • Scrap old engine(s) or vessel, as applicable. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Demonstrate proof of insurance on upgraded or replaced equipment. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Certify that there are no outstanding ARB violations or non-compliance with ARB regulations associated with the equipment or the owner. • Install an active GPS device (if 90% California operation is selected) or agree to install an active GPS device (if 100% California operation is selected) on the upgraded equipment, fund data collection, and report location data.

Commercial Harbor Craft (cont.)

Option (1) Repower/ Replacement of Tugboats or Towboats	Partial funding of up to the lower of 50% of the eligible cost or $175/horsepower of the old engine(s) to repower or replace an eligible tugboat or towboat equipped with Tier 0 or Tier 1 engine(s) with Tier 3 or better engine(s), as described in the project options. Tier 3 emission standards are defined in section 93118.5, title 17, chapter 1, subchapter 7.5, California Code of Regulations, Tables 1 through 3. Available project options: 1. Repower existing Tier 0 or Tier 1 engine(s) with new engine(s) meeting U.S. EPA Tier 3 emission standards (or better) and make necessary vessel modifications to accommodate the new engine(s). 2. Replace a vessel with existing Tier 0 or Tier 1 engine(s) with a new vessel powered by engine(s) meeting the latest Tier 3 emission standards (or better). 3. Additional funding to further upgrade the vessel with a hybrid power system (see Option (3) below). Eligible costs may include purchase of replacement vessel (diesel or hybrid) or purchase and installation of new engine(s) or hybrid system including vessel modifications directly related to the new engine(s) or system. Ineligible costs include GPS devices and associated monitoring and reporting costs, out of service time (dry dock) costs, fuel, design, engineering, consulting, legal fees, license, registration, taxes, insurance, operation, maintenance, and repair.
Additional Requirements	Program-funded engine repower and vessel replacement projects shall be operational (post-inspection completed, except scrappage) at least 1 year prior to any regulatory requirement for that technology or level of emissions control.
Option (2) Repower/ Replacement of Other Vessels	Partial funding of up to the lower of 80% of the eligible cost or $280/horsepower of the old engine(s) to repower or replace an eligible other vessel equipped with Tier 0 or Tier 1 engine(s) with Tier 3 or better engine(s) as described in the project options. Other vessel types may include work boats or pilot vessels involved in goods movement and high use commercial fishing vessels. Tier 3 emission standards are defined in section 93118.5, title 17, chapter 1, subchapter 7.5, California Code of Regulations, Tables 1 through 3. Available project options: 3. Repower existing Tier 0 or Tier 1 engine(s) with new engine(s) meeting the latest Tier 3 emission standards (or better) and make necessary vessel modifications to accommodate the new engine(s). 4. Replace a vessel with existing Tier 0 or Tier 1 engine(s) with a new vessel powered by engine(s) meeting the latest Tier 3 emission standards (or better). 5. Additional funding to further upgrade the vessel with a hybrid power system (see Option (3) below). Eligible costs may include purchase of replacement vessel (diesel or hybrid) or purchase and installation of a new engine or hybrid system including vessel modifications directly related to the new engine or system. Ineligible costs include GPS devices and associated monitoring and reporting costs, out of service time (dry dock) costs, fuel, design, engineering, consulting, legal fees, license, registration, taxes, insurance, operation, maintenance, and repair.

Commercial Harbor Craft (cont.)

Option (3) Retrofit/ Replacement with Hybrid Power System	Partial funding of up to the lower of 80% of the eligible cost or $100/horsepower of the existing engine(s) for a hybrid power system that reduces PM and NOx emissions by 30% through retrofit or replacement of an eligible tugboat, towboat, work or pilot boat, or high use commercial fishing vessel. Equipment owner may receive funds to repower or replace a vessel under Option (1) or (2) and to add a hybrid power system on the same upgraded vessel under Option (3). Available project options: 1. Retrofit an existing vessel with Tier 2 or Tier 3 engine(s) with a hybrid power system, and make necessary vessel modifications to accommodate the new hybrid system. 2. Replace an existing vessel with a new vessel powered by a hybrid system that includes Tier 3 (or better) engine(s). Tier 3 emission standards are defined in section 93118.5, title 17, chapter 1, subchapter 7.5, California Code of Regulations, Tables 1 through 3. Eligible costs may include purchase of replacement vessel (diesel or hybrid) or purchase and installation of new engine(s) or hybrid system including vessel modifications directly related to the new engine(s) or system. Ineligible costs include GPS devices and associated monitoring and reporting costs, out of service time (dry dock) costs, fuel, design, engineering, consulting, legal fees, license, registration, taxes, insurance, operation, maintenance, and repair.
Additional Requirements	• The hybrid power system must include a manufacturer's warranty for a minimum period of 8 years. • Project eligibility is subject to an ARB staff determination that a hybrid power system installed on a vessel reduces PM and NOx emissions by at least 30% each, compared to a similar vessel with the same operating hours and a similar duty cycle, but without the hybrid system.
Project Cost Assumptions	• Total cost of a Tier 3 engine is estimated at $290-$350/hp. • Total cost to repower a vessel with a hybrid power system is estimated at $350-$450/hp. The incremental cost to install a hybrid power system is estimated at $60-$120/hp.

B. Major Milestones for Project Completion

- Equipment order.
- Dry dock scheduled.
- Equipment acquisition.
- Dry dock start date.
- Equipment installation complete.
- Submittal of invoice to local agency for reimbursement.

C. Application Information

Equipment owners shall provide the following information and documentation in addition to the requirements described in Chapter VI., and other information ARB or local agencies may request on the equipment project applications.

1. General information

- Organization/agency/company name.
- Mailing address.
- Primary contact name and phone number.
- Person with equipment contract signing authority (owner).
- Proof of identity of equipment owner.
- Business information.
    - Number of harbor craft.
    - Number of employees.

2. Current equipment and activity information

- Harbor craft data.
    - Harbor craft name, home port.
    - Harbor craft type (tug, tow, commercial fishing, etc.).
    - Vessel model year.
    - Engine data.
        - Number of propulsion engines and U.S. EPA "Tier" level.
        - Number of auxiliary engines and U.S. EPA "Tier" level.
        - Make, model, engine year, number of cylinders, and serial numbers for each engine.
        - Engine family.
        - Rated brake horsepower/total engine displacement.
        - Fuel type.
- Documentation of harbor craft ownership.
- Harbor craft documentation.
    - U.S. Coast Guard (USCG) documentation number, if applicable.
    - CA Department of Fish and Game (DFG) license number, if applicable.
    - International Maritime Organization (IMO) number, if applicable.

- Vocation and activity data for the past 2 years (local agency may require documentation to substantiate vocation or activity data).
    - Vocation(s).
    - Percent operation within 24 nautical miles of the California coast.
    - Percent operation within California Coastal (and inland) Waters, as described in Appendix K.
    - Identification of the trade corridors in which the harbor craft routinely operated, specifically:
        - Bay Area trade corridor.
        - Central Valley trade corridor.
        - Los Angeles/Inland Empire trade corridor.
        - San Diego trade corridor.
    - Estimated average number of operating hours per engine within 24 nautical miles of the California coast.
    - Estimated average number of operating hours per engine within California Coastal (and inland) Waters.
    - Annual hours of operation.

3. Proposed equipment project information

a) Options (1) and (2): Repowers and replacements

- Vessel type.
- Engine data.
    - Number of new engines and U.S. EPA "Tier" level.
    - Make, model year, number of cylinders by engine.
    - Engine horsepower and fuel type by engine.
- Documentation of all engine modifications planned as part of the repower project, including description of upgrades to exhaust systems, electronics, etc. (for repower projects only).
- Itemized cost for each eligible expense (verifiable quote).
- Predicted vocation and activity data with new equipment.
    - Vocation.
    - Specify 90% or 100% future operation within California Coastal (and inland) Waters.
- Equipment project funding demonstration.
    - Program funds requested.
    - Source and amounts of other funding (private, local, other State, federal).
    - Request for a direct payment to vendor, if applicable.
    - Total project cost (Program funds requested plus other match funding).
    - Documentation of match funding availability.

b) Option (3): Hybrid power system

- Vessel type.
- Hybrid power system information.
  - Hybrid system make/model.
  - Horsepower of battery pack.
  - Fuel type and horsepower of hybrid system generators.
  - Engine data.
    - Number of engines and U.S. EPA "Tier" level.
    - Make, model year, number of cylinders by engine.
    - Engine horsepower and fuel type by engine.
- Documentation of all engine-related modifications planned as part of the repower project, including description of upgrades to such things as exhaust systems, electronics, etc.
- Itemized cost information for eligible expenses (verifiable quote).
- Predicted vocation and activity data with new equipment.
  - Vocation.
  - Specify 90% or 100% future operation within California Coastal (and inland) Waters.
- Equipment project funding demonstration.
  - Program funds requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Request for a direct payment to vendor, if applicable.
  - Total project cost (Program funds requested plus other match funding).
  - Documentation of match funding availability.

D. Scrap Requirements

In addition to the general scrappage requirements listed in Chapter IV.A.14., specific requirements for repower and replacement projects are shown in Table D.1 below:

Table D.1 Harbor Craft Equipment Project Scrap Requirements

Source Category	Equipment Project Option	Additional Requirements
Harbor Craft	Options (1), (2), & (3) (specific to repower)	• The local agency shall ensure the impound and transport of the old engine to the licensed dismantler up to 30 days after new engine is placed into operation. • The licensed dismantler must dismantle and destroy the old engine within 60 days of receipt. The engine destruction must be done in accordance with these Guidelines. • The licensed dismantler shall provide proof of scrappage to the local agency within 10 days of the destruction of the engine. • The engine block shall be punctured and destroyed in such a manner to eliminate the possibility of future operation. • The local agency or its designee must provide digital photographs, described below, showing the destruction of the old engine. The local agency must receive these photos within 10 days of the destruction of the engine. • The following digital photos must be taken and labeled for the project file: o View of the vessel with the identification tags visible. o Engine serial number either stamped on the block or on the tag. o Destroyed engine block.
	Options (1), (2), & (3) (additional requirements for replacements)	In addition to the scrap requirements listed above for engine repower projects: • The local agency shall ensure the impound and transport of the old vessel to the dismantler up to 30 days after the new vessel is placed into operation. • The licensed dismantler must dismantle and destroy the old vessel within 60 days of receipt of the old vessel. The destruction must be done in accordance with these Guidelines. • The vessel shall be physically destroyed in such a manner to eliminate the possibility of future operation. • Include at least one additional digital photo which documents the destruction of the vessel along with the photos described above. • The licensed dismantler shall provide proof of scrappage to the local agency within 10 days of the destruction of the old vessel.

E. Post-Inspection

- For harbor craft repower and replacement equipment projects, the post-inspection shall occur within 90 days of the owner receiving the fully operational equipment.

Table D.2 Harbor Craft Equipment Post-Inspection Requirements

Source Category	Equipment Project Option	Additional Requirements
Commercial Harbor Craft	Options (1), (2), & (3) Repower	• Inspection shall occur within 90 days of equipment owner receiving the fully operational equipment. • For all repowered main engines, document the family name, make, model year, serial number, U.S. EPA "Tier" level, and the fuel type of the new engine(s). • Start and end dates of dry dock time. • Name and contact information of company that performed the engine repower.
	Options (1), (2), & (3) Replacement	• Inspection shall occur within 90 days of equipment owner receiving the fully operational replacement equipment. • For all vessel replacements, document the family name, make, model year, serial number, U.S. EPA "Tier" level, and the fuel type of the engine(s) in the new vessel. • Name and contact information of company that replaced the vessel.

F. Recordkeeping Requirements

Equipment owners shall retain, at a minimum, all documents, invoices, and correspondence associated with the application, award, contract, purchase, installation, equipment operation (and if applicable, registration, insurance, and warranty), and reporting for at least 2 years after the end of the equipment project contact term or 3 years after final payment, whichever is later. Records shall be readily available and accessible to the local agency, ARB, or ARB designee upon request for the purposes of ongoing evaluations or audits.

G. Annual Reporting Requirements

Equipment owners shall be responsible for annual reporting to the local agency for the project life. The equipment owner annual report shall include, but is not limited to:

- Contact information (owner name, company, address, phone).
- Home port.
- Vessel type.
- Vessel identifier (e.g., USCG documentation number, DFG license number, IMO number, or other relevant vessel identifier).
- Engine make, model, year, serial number, and engine horsepower.
- Annual engine hours of operation within 24 nautical miles.
- Annual engine hours of operation within California Coastal (and inland) Waters.
- For hybrid options, annual hybrid power system hours of operation.
- Percent of operation within 24 nautical miles.
- Percent of operation within California Coastal (and inland) Waters.
- Percentage of annual travel within each of the four California trade corridors:
    - Bay Area trade corridor.
    - Central Valley trade corridor.
    - Los Angeles/Inland Empire trade corridor.
    - San Diego trade corridor.
- Summary of maintenance and inspections conducted.
- Signed certification statement that the bond-funded equipment was installed on or replaced the vessel for which it was approved and that all information submitted to the local agency is true and accurate.
- Other information as requested by the local agency.

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APPENDIX E Cargo Handling Equipment

A. Equipment Project Specifications

Eligible Equipment	Existing diesel-powered rubber-tired gantry (RTG) crane or diesel-powered yard truck operating at a seaport or intermodal railyard in a trade corridor.
General Requirements (applicable to all project options)	• Agree to accept an on-board electronic monitoring unit at any time during the project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty for the project life and insurance on upgraded equipment. • Certify that there are no outstanding ARB violations or non-compliance with ARB regulations associated with the equipment or the owner.
Option (1) RTG Crane Repower/ Replacement	Partial funding of up to the lower of 50% of the eligible cost or $500,000/crane to upgrade existing diesel powered RTG cranes with a zero-emission power system. Eligible costs may include the purchase of a new crane or installation of a zero-emission engine, necessary parts for an existing RTG crane including directly related vehicle modifications, and infrastructure to supply electrical power, utility construction, and costs associated with increasing the capacity of electrical power to the crane. For clarification on infrastructure eligible costs, see the Supplemental Procedures available on the Program website. Ineligible costs include design, engineering, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, metered costs, insurance, operation, maintenance, and repair. Projects utilizing regulatory extensions are not eligible for funding.
Requirements	Equipment owner shall: • Commit to 15 years of 100% California operation in port or intermodal railyard service in trade corridors. • Be permitted to keep the existing diesel engine installed and operational for a limited number of hours each year and do the following at their own expense: (1) install an hour meter on the existing diesel engine and (2) provide activity reports when requested by the local agency or ARB, in a format defined by ARB staff. • Commit to a maximum limit of diesel engine usage to 30 hours annually based on a rolling 3 year average. • Comply with all local permitting requirements.

Cargo Handling Equipment (cont.)

Option (2) Yard Truck Replacement	Partial funding of up to the lower of 50% of the eligible cost or $50,000/truck to replace an existing yard truck with a zero-emission yard truck. Eligible costs may include the purchase of a zero-emission yard truck. Ineligible costs include license, registration, taxes (other than federal excise and sales tax), insurance, operation, maintenance, and repair.
Requirements	Equipment owner shall: • Commit to 5 years of 100% California operation in port or intermodal railyard service in the four California trade corridors. • Demonstrate proof of equipment warranty for the project life and insurance on upgraded equipment.
Project Cost Assumptions	• Total estimated cost of repowering an existing RTG crane with a zero-emission power system is ~$400,000/crane. • Total estimated cost to modify port for space to electrify an RTG crane is ~$200,000/connection. • Total estimated cost of a zero-emission power system for an RTG crane is ~$1 million. • Total estimated cost of a zero-emission power system for a yard truck is ~$200,000, with an incremental cost (above a complying diesel engine) of ~$100,000.

B. Major Milestones for Project Completion

- Equipment order.
- Equipment acquisition/installation.
- Submittal of invoice to local agency for reimbursement.

C. Application Information

Equipment owners shall provide the following information and documentation in addition to the requirements described in Chapter VI., and other information ARB or local agencies may request on the equipment project applications.

The following sections apply to all equipment project options.

1. General information

- Organization/agency/company name.
- Mailing address.
- Primary contact name and phone number.
- Person with equipment contract signing authority (owner).
- Proof of identity of equipment owner.
- Number of pieces of diesel cargo handling equipment.
- Business information.
    - Fleet size.
    - Number of employees.

2. Current equipment and activity information

a) Rubber-tired gantry crane

- Rubber-tired gantry crane (RTG) data.
  - Port or railyard where RTG crane operates.
  - Specific location.
  - Equipment make, model, model year.
  - RTG crane identification number or vehicle identification number (VIN).
  - Engine data (per engine).
    - Engine make, model, engine year, type (off-road or on-road).
    - Serial number.
    - Horsepower and fuel type.
- Activity data for the past 2 years.
  - Annual hours of operation.

Additional documentation may be requested by the local agency to verify information reported on the application.

b) Yard truck

- Yard truck data.
  - Port or railyard where yard truck operates.
  - Truck make, model, model year.
  - Yard truck identification number or vehicle identification number VIN.
  - Diesel engine data (per engine).
    - Engine make, model, engine year, type (off-road or on-road).
    - Serial number.
    - Horsepower and fuel type.
- Activity data for the past 2 years.
  - Annual hours of operation.
  - Identify the trade corridors in which the equipment is routinely operated.

Additional documentation may be requested by the local agency to verify information reported on the application.

3. Proposed equipment project information

a) Rubber-tired gantry crane

- Zero-emission RTG data.
  - Equipment make, model, model year.
  - Equipment power rating.
- Itemized cost information for eligible expenses (verifiable quote).
- New equipment information to calculate emission reductions, as determined by ARB.
- Equipment project funding demonstration.
  - Program funds requested.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Total project cost (Program funds requested plus other match funding).
  - Documentation of match funding availability.

b) Yard truck

- Zero-emission yard truck data.
  - Truck make, model, model year.
  - Equipment power rating.
- Itemized cost for each eligible expense (verifiable quote).
- New equipment information to calculate emission reductions, as determined by ARB.
- Equipment project funding demonstration.
  - Total project cost.
  - Program funds requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Request for a direct payment to vendor (if applicable).
  - Total project cost (Program funds requested plus other match funding).
  - Documentation of match funding availability.

D. Scrappage

Table E.1 Cargo Handling Equipment Project Scrap Requirements

Source Category	Equipment Project Option	Additional Requirements

Cargo Handling Equipment	Option (1) RTG Crane Replacement	• The local agency shall ensure the impound and transport of the old engine to the licensed dismantler up to 30 days after the new power system is placed into operation.
		• The licensed dismantler must dismantle and destroy the old engine within 60 days of receipt. The engine destruction must be done in accordance with these Guidelines.
		• The engine block shall be punctured and destroyed in such a manner to eliminate the possibility of future operation.
		• The licensed dismantler shall provide proof of scrappage to the local agency within 10 days of the destruction of the engine.
		• The local agency or its designee must provide digital photographs, described below, showing the destruction of the old engine. The local agency must receive these photos within 10 days of the destruction of the engine.
		• The following digital photos must be taken and labeled for the project file:
		  ○ Existing RTG crane or yard truck (as applicable) view from front angle.
		  ○ Engine serial number either stamped on the block or on the tag.
		  ○ Destroyed engine block.

	Option (2) Yard Truck Replacement	In addition to the requirements listed above for RTG crane replacement projects: • The local agency shall ensure the impound and transport of the old yard truck to the dismantler up to 30 days after the new vehicle is placed into operation. • The licensed dismantler must dismantle and destroy the old yard truck within 60 days of receipt. The destruction must be done in accordance with these Guidelines. • Sever the old vehicle frame rails to ensure that the vehicle is rendered useless and to prevent repeated use. • Include at least one additional digital photo which documents the destruction of the vehicle along with the photos listed above. • The licensed dismantler shall provide proof of scrappage to the local agency within 10 days of the destruction of the vehicle.

E. Post-Inspection

For cargo handling equipment projects, the post-inspection shall occur within 60 days of owner receipt of fully operational equipment.

Table E.2 Cargo Handling Equipment Post-Inspection Requirements

Source Category	Equipment Project Option	Additional Requirements
Cargo Handling Equipment	Option (1) RTG Crane Repower/ Replacement	• Name of power system manufacturer. • Serial number and month/year of power system manufacture. • Inspection shall occur within 60 days of owner receipt of fully operational equipment.
	Option (2) Yard Truck Replacement	• Vehicle type. • Vehicle identification number (VIN). • Vehicle make, model, model year. • Gross vehicle weight rating (GVWR). • Fuel type.

F. Recordkeeping Requirements

Equipment owners shall retain, at a minimum, all documents, invoices, and correspondence associated with the application, award, contract, purchase, installation, equipment operation (and if applicable, registration, insurance, and warranty), and reporting for at least 2 years after the end of the equipment project contact term or 3 years after final payment, whichever is later. Records shall be readily available and accessible to the local agency, ARB, or ARB designee upon request for the purposes of ongoing evaluations or audits.

G. Annual Reporting Requirements

Equipment owners shall be responsible for annual reporting to the local agency for the project life. The equipment owner annual report shall include, but is not limited to:

- Contact information (owner name, company, address, phone).
- Date and location of installation of equipment.
- Equipment type and name of home port or railyard.
- RTG crane or yard truck make, model, year, serial number, and power rating.
- Annual hours of operation.
- Summary of maintenance and inspections conducted.
- Signed certification statement that the bond-funded technology was installed on the equipment for which it was approved, and that all information submitted to the local agency is true and accurate.
- Other information as requested by the local agency.

APPENDIX F

Project Specifications for FY2008-09 (Year 2) and FY2011-12 (Year 3) Funds for March-April 2011 Solicitations – Heavy-Duty Diesel Truck Source Category

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Heavy Duty Diesel Trucks

(Combines Port/Railyard and Other Trucks)

A. Equipment Project Specifications

Eligible Equipment	Heavy duty diesel trucks used to move goods (a majority of the time) with a manufacturer's gross vehicle weight rating (GVWR) of 26,001 lbs or greater listed on the application and verified at pre-inspection.
	
	Equipment owner must demonstrate:
	o At least 75% operation within California for the past 2 years.
	o At least 5,000 vehicle miles traveled (VMT) each year for the past 2 years.
	o Registration:
	  o Continuous registration (California base-plated or California International Registration Plan (California IRP)) in California for the past 2 years. Dual plates and out-of-state registrations are prohibited, except for trucks that carry goods across the California-Mexico border which are required to be dual-plated (California and Mexico only), or
	  o Current California registration and minimum 8 months available California Department of Motor Vehicles (DMV) registration history supplemented by alternate documentation showing California operation for the past 2 years.
	  o Partial year registration may be allowed significant emission reductions for the state dollars invested. Mileage documentation and registration information shall be reviewed by the local agency for consistency.
	o New engines for repower or replacement projects meet the applicable Program requirements:
	  o 2010 emissions means 0.20 g/bhp-hr or less NOx (FEL and CERT values) and 0.01 g/bhp-hr or less PM (CERT value) as certified by an ARB Executive Order for on-road use.
	  o 2007+ emissions means 0.50 g/bhp-hr or less NOx (FEL and CERT values) and 0.01 g/bhp-hr or less PM (CERT value) as certified by an ARB Executive Order for on-road use.
	  o 2007 emissions means 1.20 g/bhp-hr or less NOx (FEL and CERT values) and 0.01 g/bhp-hr or less PM (CERT value) as certified by an ARB Executive Order for on-road use.
	  o For Class 8 trucks the engines must be certified by an ARB Executive Order for on-road use with an intended service of Heavy Heavy Duty Diesel (HHDD) for diesel engines or Heavy Duty Otto (HDO) for applicable alternative fuel vehicles.
	o New or used trucks purchased for a truck replacement project must have a manufacturer's GVWR of 26,001 lbs – 33,000 lbs (Class 7) or of 33,001 lbs or greater (Class 8). The replacement truck must be in the same weight classification range (Class 7 or Class 8) as the existing truck, except when the equipment owner chooses to replace 2 eligible trucks for 1 replacement truck under Option (4).

Heavy Duty Diesel Trucks (cont.)

Eligible Equipment (continued)	A drayage truck means any in-use on-road vehicle (GVWR of 26,001 lbs or greater) that pulls a trailer or chassis that is used for transporting cargo (such as containerized, bulk, or break-bulk goods) that operates: o On or transgresses through port or intermodal railyard property for the purpose of loading, unloading, or transporting cargo, including transporting empty containers and chassis, or o Off-port or intermodal railyard property transporting cargo or empty containers or chassis that originated from or is destined to a port or intermodal railyard property. Drayage truck owners are eligible to apply for priority drayage truck funding that may be available (not available in every solicitation) for truck replacement or PM + NOx retrofit projects if the owner demonstrates all of the following for the existing truck: • Meets all of the other requirements of this section. • Made at least 12 visits to California ports and railyards (combined) over the last 12 months. • **For truck replacement projects (Option 4)**, has a MY1994-2003 engine, and was registered in the California Drayage Truck Registry and was retrofitted with an ARB-verified Level 3 diesel particulate filter by June 30, 2010. • **For PM + NOx retrofit projects (Option 2)**, has a MY2004-2006 engine, was registered in the California Drayage Truck Registry by June 30, 2010, and would be upgraded with a PM + NOx retrofit no later than December 31, 2010. • **For three-way truck transactions (Option 5)**, please see page A-6. Note: If priority drayage truck funding is not available or is exhausted before all eligible drayage trucks are funded, any remaining, unfunded drayage trucks will compete with other trucks.
Ineligible Equipment	o Trucks subject to ARB's public and utility fleet rule. o Trucks subject to ARB's solid waste collection vehicle rule. o Trucks subject to ARB's diesel cargo handling equipment rule.

Heavy Duty Diesel Trucks (cont.)

General Requirements (applicable to all project options)	Equipment owner shall: • Commit to the project life specified with the applicable equipment project option. • Adhere to all Program requirements during the project life. • Commit to 100% California-only operation (or 90% California-only operation as selected by the equipment owner) and California base-plated registration or California IRP. Dual plates and out-of-state registrations are prohibited, except for trucks that carry goods across the California-Mexico border which are required to be dual-plated (California and Mexico only). • Commit to at least 50% of travel within the four trade corridors for the duration of the project life. • Maintain current DMV registration at all times during the project life. • Agree to accept an on-board electronic monitoring unit at any time during project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain truck in good operating condition and according to manufacturer's recommendations. • Maintain collision/comprehensive insurance on the truck for replacements. • Demonstrate proof of equipment warranty on the program-funded equipment. • Correct outstanding ARB equipment violations associated with the owner's entire fleet of vehicles. ARB will post and update information on the Program website describing operational deadlines and when the program-funded vehicle will become eligible to be included in the equipment owner's Statewide Truck and Bus Rule fleet compliance strategy for the applicable project option.
Modifying an Application	Equipment owners may change the project option or lease-to-own program participation after the local agency solicitation period has closed if permitted by the local agency and subject to the following requirements: • The change must result in a funding amount equal to or less than the amount that was requested in the original application. • The change must result in a calculated project cost-effectiveness equal to or greater than the project listed in the original application. Equipment owners cannot substitute a different vehicle or change the ownership of the existing vehicle identified on the application after the local agency solicitation period has closed.

Heavy Duty Diesel Trucks (cont.)

Option (1) PM Retrofit	Partial funding (see options below) to retrofit an eligible MY1994-2006 heavy duty diesel engine with an ARB verified Level 3 Plus diesel particulate filter that reduces PM by 85% or more. Drayage trucks are not eligible.
Funding Options	1. $5,000/truck with a project life of 2 years. Program-funded diesel particulate filter shall be installed and operational (post-inspection completed) prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing operational deadlines for the applicable project option. 2. $10,000/truck with project life of 4 years. Program-funded diesel particulate filter shall be installed and operational (post inspection completed) prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing operational deadlines for the applicable project option.
Requirements	In addition to the General Requirements listed previously, equipment owner shall: • Demonstrate that any mid-1990s engine subject to the software upgrades for diesel trucks (i.e., chip reflash) has completed the upgrade.
Option (2) PM + NOx Retrofit	Partial funding of up to $20,000/truck to retrofit an eligible MY2004-2006 heavy duty diesel truck engine with an ARB-verified diesel emission control strategy (VDECS) that reduces diesel PM by 85% or more and reduces NOx exhaust emissions as shown below: • For 2007 emissions: a reduction of NOx exhaust emissions by at least 40% (ARB Mark 2 rating). • For 2010 emissions: a reduction of NOx exhaust emissions by at least 85% (ARB Mark 5 rating).
Requirements	Program-funded VDECS and diesel particulate filter shall be installed and operational (post-inspection completed) prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing operational deadlines for the applicable project option. In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of 5 years or 500,000 miles, whichever comes first.
Option (3) Repower	Partial funding of up to $30,000/truck to repower a truck with an eligible MY1994-2006 heavy duty diesel engine with a new engine that meets 2010 emissions.
Requirements	Program-funded engine shall be installed and operational (post-inspection completed, except scrappage) prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing operational deadlines for the applicable project option. In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of 5 years or 500,000 miles, whichever comes first. • Scrap the old engine. • Purchase a minimum of a 1-year or 100,000-mile major component engine warranty for the replacement engine that covers parts and labor. • Provide a copy of ARB Executive Order documenting that the new engine meets 2010 emissions.

Heavy Duty Diesel Trucks (cont.)

Option (4) Replacement	Partial funding (see options below) to replace 1 or 2 truck(s) equipped with eligible MY2003 or older heavy duty diesel engine(s) with a diesel or alternative fuel truck
Funding Options (drayage trucks)	Owners of eligible drayage trucks with a MY1994-2003 engine that commit to 90% or 100% California-only operation may have the option to compete for funding as follows. Class 8 truck (GVWR of 33,001 lbs or greater): 1. $50,000/truck for a replacement truck with a heavy heavy duty engine that meets 2010 emissions (0.20 g/bhp-hr or less NOx). Note: To be eligible, the replacement truck must have less than 500,000 miles with odometer verification at the post inspection. Class 7 truck (GVWR of 26,001 lbs – 33,000 lbs): 1. $30,000/truck for a replacement truck with an engine that meets 2010 emissions (0.20 g/bhp-hr or less NOx). Note: To be eligible, the replacement truck must have less than 250,000 miles with odometer verification at the post inspection. The maximum funding amount for replacement trucks will be reduced if Program funds were previously received to install a diesel particulate filter.
Funding Options (other trucks)	Owners of all eligible non-drayage trucks that commit to 90% or 100% California-only operation can compete for funding as follows. Class 8 truck (GVWR of 33,001 lbs or greater): 3. $60,000/truck for a replacement truck with a heavy heavy duty engine that meets 2010 emissions (0.20 g/bhp-hr or less NOx). 4. $50,000/truck for a replacement truck with a heavy heavy duty engine that meets 2007+ emissions (0.50 g/bhp-hr or less NOx). 5. $40,000/truck for a replacement truck with a heavy heavy duty engine that meets 2007 emissions (1.20 g/bhp-hr or less NOx). Note: To be eligible, the replacement truck must have less than 500,000 miles with odometer verification at the post inspection. Class 7 truck (GVWR of 26,001 lbs – 33,000 lbs): 2. $40,000/truck for a replacement truck with an engine that meets 2010 emissions (0.20 g/bhp-hr or less NOx). 3. $30,000/truck for a replacement truck with an engine that meets 2007+ emissions (0.50 g/bhp-hr or less NOx). 4. $25,000/truck for a replacement truck with an engine that meets 2007 emissions (1.20 g/bhp-hr or less NOx). Note: To be eligible, the replacement truck must have less than 250,000 miles with odometer verification at the post inspection. The maximum funding amount for replacement trucks will be reduced if Program funds were previously received to install a diesel particulate filter.
Requirements	Program-funded replacement projects shall be purchased and operational (post-inspection completed, except scrappage) prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing operational deadlines for the applicable project option. In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of at least 5 years or 350,000 miles (for priority drayage trucks)/500,000 miles (for other trucks), whichever comes first. • Scrap the old truck(s). Purchase a minimum of a 1-year or 100,000-mile major component engine warranty for the replacement vehicle that covers parts and labor. • Provide a copy of ARB Executive Order documenting that the new truck engine meets the applicable 2007, 2007+, or 2010 emissions.

Heavy Duty Diesel Trucks (cont.)

Option (5) Three-Way Truck Transactions	3. Replace an eligible truck that has a MY1998-2006 engine (Truck A) with a diesel or alternative fuel truck (Truck C) with an engine that meets 2010 emissions (0.20 g/bhp-hr or less NOx). 4. Retrofit Truck A with an ARB-verified Level 3 Plus diesel particulate filter that reduces diesel PM by 85% or more. 5. Scrap a MY1993 or older diesel truck (Truck B) and replace with Truck A. Truck A: Heavy duty diesel truck with MY1998-2006 engine. Truck B: Heavy duty diesel truck with MY1993 or older engine. Truck C: Heavy duty truck (diesel or alternative) that meets 2010 emissions.
Funding Options (drayage trucks)	1. $50,000 for Truck C if Truck A is Class 8 (GVWR of 33,001 lbs or greater).
Funding Options (other trucks)	5. $60,000 for Truck C if Truck A is Class 8 (GVWR of 33,001 lbs or greater). 6. $40,000 for Truck C if Truck A is Class 7 (GVWR of 26,001 lbs – 33,000 lbs). 7. Up to $5,000 to retrofit Truck A.
Requirements	Truck C shall be purchased and operational (post inspection completed, except scrappage) prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. ARB will post and update information on the Program website describing deadlines for the applicable project option. Truck C must be the same class as Truck A. Note: To be eligible, Truck C must have less than 500,000 miles if Class 8 (250,000 miles if Class 7) with odometer verification at the post inspection. Truck B may be Class 7 or Class 8. Truck A shall be equipped with an operational diesel particulate filter by the operational deadlines for a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks if optional retrofit funding is received for Truck A. ARB will post and update information on the Program website describing operational deadlines for the applicable project option. In addition to the applicable General Requirements listed previously in Appendix A, the original owner of Truck A and new owner of new Truck C shall: • Equip Truck A with an ARB verified Level 3 Plus diesel particulate filter and transfer ownership (if applicable) to the owner of old Truck B. • Commit to a project life of 5 years or 500,000 miles, whichever comes first, on Truck C. • Commit to 90% or 100% California-only operation. • Purchase a minimum of a 1-year or 100,000-mile major component engine warranty for Truck C that covers parts and labor. • Provide a copy of ARB Executive Order documenting that the new truck engine in Truck C meets 2010 emissions. • Demonstrate that any mid-1990s engine subject to the software upgrades for diesel trucks (i.e., chip reflash) has completed the upgrade on Truck A. In addition to the applicable General Requirements listed previously in Appendix A, the original owner of old Truck B and new owner of retrofit Truck A shall: • Scrap Truck B. • Commit to a project life of 2 years and all applicable Program requirements on Truck A, if retrofit funding is received. • Commit to 90% or 100% California-only operation.

Heavy Duty Diesel Trucks (cont.)

Eligible Equipment	Truck stops, intermodal facilities, distribution centers, and other places where Class 8 heavy duty diesel trucks (GVWR of 33,001 lbs or greater) congregate in a trade corridor.
Option (6) Electrification Infrastructure for Truck Stop or Distribution Center	Landside electrification infrastructure to reduce diesel engine idling and use of diesel-fueled internal combustion auxiliary power systems may be funded at the lower of 50% of eligible project costs or a level commensurate with a cost-effectiveness of 0.20 pounds of weighted emissions reduced per State dollar invested. Truck stop/distribution center electrification infrastructure projects shall be eligible to compete for funding only if the cost-effectiveness is equal or greater than 0.20 pounds of weighted emissions reduced per State dollar invested. Eligible costs include purchase and installation of electrical infrastructure to: enable heating, cooling, and the use of cab power for parked trucks at truck stops; and enable the use of power for transport refrigeration units and auxiliary power systems at distribution centers, intermodal facilities, and other places where trucks congregate. Reimbursement for the eligible costs shall be based on demonstrated use over the first year of operation. Ineligible costs include on-board auxiliary power units and other equipment installed on trucks, transport refrigeration units, electricity costs, and operation and maintenance costs.
Requirements	In addition to the General Requirements listed previously, equipment owner shall: • Commit to 10 years of operation. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty. • Comply with all local permitting requirements.
Project Cost Assumptions	• Option (1): Average cost of a diesel particulate filter is expected to be ~$15,000. • Option (2): Total cost of a NOx + PM retrofit is expected to be ~$40,000. • Option (3): Total cost of a repower project is expected to be ~$60,000. • Options (4) & (5): Total cost of a new 2010 emissions truck is expected to be ~$80,000 (Class 7 diesel) to ~$180,000 (Class 8 natural gas). Total cost of a 2007 or 2007+ emissions truck (in 2011-2012) is expected to be ~$50,000 (Class 7 diesel) to ~$80,000 (Class 8 diesel). • Option (6): Total cost for distribution centers is $1,500-$7,000/plug at dock; $2,500-$9,000/plug in parking areas; $500-$2,000/adapter for trailers and TRUs. Total cost for truck stops is $6,000-$18,000/parking space; $3,000/truck modification.

B. Major Milestones for Project Completion

1. Heavy duty diesel trucks

- Equipment order.
- Equipment acquisition/installation.
- Submittal of invoice to local agency for payment.
- Scrappage of old truck or engine.

2. Truck stop/distribution center electrification

The equipment project schedule shall include, but is not limited to, the following milestones:

- Completion and certification of any required CEQA documents.
- Bid solicitation, evaluation and award, and construction contract.
- Acquisition of any local permits, or other requirements.
- Electrification system design, unit acquisition, and delivery.
- Project completion.
- Post-inspection by the local agency.
- Reporting to local agency of actual electrical use by trucks during first year of operation.
- Submittal of invoice to local agency for reimbursement.

C. Application Information

Equipment owners shall provide the following information and documentation in addition to the requirements described in Chapter VI., and other information ARB or local agencies may request on the equipment project applications. The local agency shall enter the equipment application information into the Goods Movement Online Database.

All equipment project applications must include the information specified below in:

- Section 1 – General information.
- Section 2 – Current equipment and activity information.
- Section 3 – Proposed equipment project information. (Include information, as applicable, for each equipment project option.)

1. General information

This section applies to all equipment project options.

- Name or applicant (current owner of existing truck, including for potential lease-to-own institutions).
- Business name.
- Mailing address.
- Primary contact name and phone number.
- Person with equipment contract signing authority (owner).
- Proof of identity of current equipment owner (and lessor for lease-to-own).
- Business information:
  - Fleet size.
  - Number of employees (optional).
  - Number of truck spaces (truck stops).
  - Number of docks (distribution centers).
- A statement signed and dated by the current equipment owner acknowledging all application items are true/correct and all outstanding ARB violations on any equipment within the owner's entire fleet will be corrected.

2. Current equipment and activity information

a) Heavy duty diesel trucks

- Truck data.
  - Truck make, model, and model year.
  - Vehicle Identification Number.
  - Gross vehicle weight rating (GVWR).
  - Vehicle license plate number.
  - Engine make, model, engine year, and serial number.
  - Engine horsepower and fuel type.
  - Current odometer reading (estimate total engine mileage if odometer is missing or broken).
  - Date a diesel particulate filter was previously installed on truck and verified control level of that filter (if applicable).

- Truck documentation.
  - Current California registration including registered owner (California base-plated registration or California IRP; dual plates and out-of-state registrations are prohibited, except for trucks that carry goods across the California-Mexico border, as they are required to be dual-plated (California and Mexico only)).
  - Registration showing California operation for the past 2 years or 8 months of available California DMV registration history supplemented by alternate documentation showing California operation for the past 2 years.
    - Partial year registration may be allowed for trucks that, due to their vocation, register on a partial year basis. These trucks must have a consistent pattern of registration that establishes California operation over the past 2 years, and the pattern of operation must be consistent with the equipment owner's vocation. Mileage documentation and registration information shall be reviewed by the local agency for consistency.
  - Documentation of current ownership (copy of title of truck) for any truck that will be scrapped or reused. This requirement does not apply to retrofit or repower projects.
- Vocation and activity data for the past 2 years (unless noted otherwise).
  - Vocation(s) – the types of goods typically transported.
  - Drayage Truck Registry (DTR) status as of June 30, 2010.
  - Number of California port and railyard visits (combined) in the past 12 months.
  - Annual vehicle miles of travel (VMT) in California.
  - Estimated percentage of annual VMT in:
    - Bay Area trade corridor.
    - Central Valley trade corridor.
    - Los Angeles/Inland Empire trade corridor.
    - San Diego/Border trade corridor.
  - Documentation to verify reported VMT is required. Examples of documentation include logbooks, fuel records, maintenance records, or tax records.
  - For concrete mixer trucks, dump trucks, and other truck types specifically identified by ARB staff, the owner may provide the Power Take Off (PTO) hours in conjunction with VMT:
    - Documentation from the hour meter unit is required.
    - PTO hours will be converted to miles based on factors supplied by ARB and combined with VMT in the calculation of emission reductions and cost-effectiveness.

Additional documentation may be requested by the local agency.

b) Truck stop/distribution center electrification

- Location and description of facility where electrification infrastructure is proposed for installation.
- Quantification of current annual truck operations and TRU operations at the facility.
- Baseline emissions (without the project) for first 10 years of operation of proposed electrical infrastructure (developed with the concurrence of the local air district) – this emission estimate shall fully reflect the benefits of all adopted regulations including ARB rules for trucks, idling, auxiliary power systems, TRUs, and TRUs with generators sets.

Additional documentation may be requested by the local agency.

3. Proposed equipment project information

a) Option (1): PM retrofit

- Retrofit device data.
  - ARB-verified retrofit device company and name of device.
  - ARB Executive Order number for retrofit device.
  - ARB-verified NOx reduction and PM reduction (percentages).
- Itemized cost information for eligible expenses (verifiable quote).
- Equipment project funding demonstration.
  - Total project cost.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Request for a direct payment to vendor (if applicable).
  - Total project cost (Program dollars requested plus other match funding).
  - Documentation of match funding availability.

b) Option (2): PM + NOx retrofit

- Retrofit device data.
  - ARB-verified retrofit device company and name of device.
  - ARB Executive Order number for retrofit device.
  - ARB-verified NOx reduction and PM reduction (percentages).
- Itemized cost information for eligible expenses (verifiable quote).
- Equipment project funding demonstration.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Request for a direct payment to vendor (if applicable).
  - Total project cost (Program dollars requested plus other match funding).
  - Documentation of match funding availability.

c) Option (3): Repower

- Engine repower data.
  - Engine make, engine model, and engine year.
  - Engine horsepower and fuel type.
- Repower documentation.
  - Documentation of all engine/truck modifications planned as part of the repower project. Include description of upgrades to such things as exhaust systems, electronics, etc.
- Itemized cost information for eligible expenses (verifiable quote).
- Equipment project funding demonstration.
  - Total project cost.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Total project cost (Program dollars requested plus other match funding).
  - Documentation of match funding availability.

d) Option (4): Replacement

- New truck data.
  - Truck make, model, and model year.
  - Manufacturer's gross vehicle weight rating (GVWR).
  - Engine make, engine model, and engine year.
  - Engine horsepower and fuel type.
- Itemized cost information for eligible expenses (verifiable quote).
- Equipment project funding demonstration.
  - Total project cost.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Request for a direct payment to vendor (if applicable).
  - Total project cost (Program dollars requested plus other match funding).
  - Documentation of match funding availability.
  - Interest in lease-to-own option or loan assistance program.

e) Option (5): Three-way truck transaction

- Truck A (retrofitted truck) data.
  - ARB-verified retrofit device company and name of device.
  - ARB Executive Order number for retrofit device.
  - ARB-verified NOx reduction and PM reduction (percentages).
  - Itemized cost information for eligible expenses (verifiable quote).
- Truck B (scrapped truck) data.
  - Equipment owner name (if different from Truck A).

- Equipment project funding demonstration.
  - Total project cost.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Request for a direct payment to vendor (if applicable).
  - Total project cost (Program dollars requested plus other match funding).
  - Documentation of match funding availability.
- Truck C (new truck) Data
  - Truck make, model, and model year.
  - Manufacturer's gross vehicle weight rating (GVWR).
  - Engine make, engine model, and engine year.
  - Engine horsepower and fuel type.
- Truck C itemized cost information for eligible expenses (verifiable quote).
- Equipment project funding demonstration (combined Truck A and Truck C).
  - Total project cost.
  - Program dollars requested.
  - Source and amounts of other funding (private, local, other State, federal).
  - Request for a direct payment to vendor (if applicable).
  - Total project cost (Program dollars requested plus other match funding).
  - Documentation of match funding availability.

f) Option (6): Truck stop/distribution center electrification

- Electrification infrastructure information.
  - Project description and design, including number and location of electrification units to be installed, with individual and total power requirements.
  - Equipment vendor(s).
  - Itemized cost information by phase (e.g., design, environmental, construction).
- Predicted activity data with new equipment.
  - Estimated annual truck connections to electric power and average connection time.
  - Estimated annual TRU connections to electrical power and average connection time.
  - Expected power usage for trucks and TRUs (separately), each year for the first 10 years of operation.
- Projected emissions and benefits of the project.
  - Emissions with the project over a 10-year period.
  - Emission reductions attributable to the project (beyond those required by law or regulation) for a 10-year period beginning in the 1st year of operation.
  - Demonstration that the weighted emission reductions per State dollar invested is equal or better than 0.20 pounds per State dollar.

- Equipment project funding demonstration.
  - Program dollars requested.
  - Funding sources and amounts of other funding (private, local, other State, federal).
  - Total project cost (Program dollars requested plus other match funding).
  - Documentation of match funding availability.

D. Scrap Requirements

In addition to the general scrappage requirements listed in Chapter IV.A.14., specific requirements for repower, replacement, and three-way truck transaction projects are shown in Table F.1 below.

Table F.1 Truck Equipment Project Scrap Requirements

Source Category	Equipment Project Option	Additional Requirements
Heavy Duty Diesel Trucks	Option (3) Repower	• The local agency shall ensure the impound and transport of the old engine to the licensed dismantler within 30 calendar days of the new engine being placed into operation. • The licensed dismantler must dismantle and destroy the old engine within 60 calendar days of receipt. The engine destruction must be done in accordance with these Guidelines. • The engine block shall be punctured and crushed in such a manner to eliminate the possibility of future operation and use of any components. • The licensed dismantler shall provide proof of scrappage to the local agency within 10 calendar days of the destruction of the engine. • The local agency or its designee must provide digital photographs, described below, showing the destruction of the old engine. The local agency must receive these photos within 10 calendar days of the destruction of the engine. • The following digital photos must be taken and labeled for the project file: 1. Engine tag with serial number, engine family number, and engine model year. 2. Destroyed engine block.

Table F.1 Truck Equipment Project Scrap Requirements (cont.)

Source Category	Equipment Project Option	Additional Requirements
Heavy Duty Diesel Trucks	Option (4) Replacement	In addition to the requirements listed above for engine repower projects, replacement projects require: • The local agency shall ensure the impound and transport of the old truck(s) to the dismantler within 30 calendar days of the replacement vehicle being placed into operation. • The licensed dismantler must dismantle and destroy the old truck(s) within 60 calendar days of receipt. The destruction must be done in accordance with these Guidelines. • Sever the old vehicle frame rails to ensure that the vehicle is rendered useless and to prevent repeated use. • The following digital photos must be taken and labeled for the project file: 1. Engine tag with serial number, engine family number, and engine model year. 2. Destroyed engine block either inside or outside truck body. 3. Vehicle Identification Number printed by manufacturer inside cab. 4. Truck view from front angle capturing entire truck with readable license plate. • The equipment owner or licensed dismantler must file a VIN hold with DMV, and submit either REG 488C "Non-Repairable Vehicle Certificate" or REG 42 "Notice to Dismantler," to DMV, and submit a copy to the local agency at the time of the post-inspection. Any additional substitute documentation must be verified by ARB to ensure that the scrapped equipment is permanently removed from service. • The licensed dismantler shall provide proof of scrappage to the local agency within 10 calendar days of the destruction of the vehicle.
	Option (5) Three-way Truck Transaction	• Truck B (old truck) must be scrapped in accordance with the equipment project scrap requirements listed in Option 4.

E. Post-Inspection

- For truck replacement equipment projects, the post-inspection shall occur within 60 calendar days of the old truck(s) being delivered to a certified dismantler.
- For truck retrofit equipment projects, the post-inspection shall occur within 30 calendar days of installation of the fully operational equipment.
- For truck stop/distribution equipment projects, the post-inspection shall occur within 60 calendar days of owner receipt of fully operational equipment.

Table F.2 Truck Post-Inspection Requirements

Source Category	Equipment Project Option	Additional Requirements
Heavy Duty Diesel Trucks	PM Retrofit or PM + NOx Retrofit	• Name, address, and telephone number of company(s) that installed the retrofit. • Name of the retrofit manufacturer(s). • Retrofit model and serial number(s). • Year that the retrofit was manufactured (if not listed on device label, information may be obtained from the retrofit manufacturer by reference to serial number). • Date the retrofit was installed. • If not in the application file, copy of ARB Executive Order documenting the retrofit meets the specifications.
	Repower	• Name, address, and telephone number of company(s) that installed the new engine. • Engine make, model, model year. • Engine family name and number. • Engine serial number. • Date the new engine was installed. • If not in the application file, copy of ARB Executive Order documenting that the new engine meets 2010 emissions.

Table F.2 Truck Post-Inspection Requirements (cont.)

Source Category	Equipment Project Option	Additional Requirements
Heavy Duty Diesel Trucks	Replacement	• Vehicle type. • Vehicle identification number (VIN). • Vehicle make, model, model year. • Fuel type. • Vehicle license plate number (for a new vehicle, owner shall provide license plate number upon receipt from the DMV). • CA Highway Patrol number. • Engine make, model year, engine year. • Engine family name and number. • If not in the application file, copy of ARB Executive Order documenting that the replacement truck engine meets 2010 emissions, 2007+ emissions, or 2007 emissions, as applicable.
	Three-way Truck Transaction	* See individual post inspection requirements for retrofit and replacement.

	Truck Stop/ Distribution Center	• Name of power system manufacturer.
		• Serial number and date of manufacture.
		• Rated amperage, voltage.
		• Verification that each project's pedestal and/or external air conditioning/power system is operational.
		• Inspection shall include verification of operation by connecting heavy duty truck cab and/or transport refrigeration unit (as appropriate) to a random number of pedestals or external air conditioning/power system.
		• Inspections:
		  ○ An initial inspection shall be completed within 60 calendar days of owner receipt of fully operational equipment.
		  ▪ The initial inspection shall include a review of equipment owner's procedures to collect use data for first year of operation.
		  ○ A second inspection (which corresponds to the proper post-inspection) shall be completed within 60 calendar days of owner completion of first year of operation.
		  ▪ Reimbursement of equipment costs can only be requested after obtaining a satisfactory second inspection.

F. Recordkeeping Requirements

Equipment owners shall retain, at a minimum, all documents, invoices, and correspondence associated with the application award, contract, purchase, installation, equipment operation (and if applicable, registration, insurance, and warranty), and reporting for at least 2 years after the end of the equipment project contact term or 3 years after final payment, whichever is later. Records shall be readily available and accessible to the local agency, ARB, or ARB designee upon request for the purposes of ongoing evaluations or audits.

G. Annual Reporting Requirements

1. Heavy duty diesel trucks

Equipment owners shall be responsible for annual reporting to the local agency except for owners with PM retrofits with a 2-year contract who only need to report at the end of the 2 year project life. The equipment owner shall submit annual reports for the equipment project life. The equipment owner's annual report shall include, but is not limited to:

- Contact information (owner name, address, phone, etc.).
- Fleet size.
- Proof of California registration.
- Proof of insurance.
- Current odometer reading, including the date read (estimate total vehicle mileage if odometer is missing or broken).
- Annual VMT since last report.
- Certification of the required 90 percent or 100 percent California-only operation. Certification of at least 50 percent of travel in the four trade corridors as well as provide the percentage of annual vehicle miles of travel in:
    - Bay Area trade corridor.
    - Central Valley trade corridor.
    - Los Angeles/Inland Empire trade corridor.
    - San Diego/Border trade corridor.
- Summary of maintenance performed and inspections conducted.
- Certification that the bond-funded project was operated in accordance with the signed contract, and that all information submitted is true and accurate.
- Other information as requested by the local agency.

2. Truck stop/distribution center electrification

Equipment owners shall be responsible for annual reporting to the local agency for the project life. The equipment owner annual report shall include, but is not limited to:

- Contact information (owner name, company, address, phone).
- Facility location.
- Project completion date.
- Monthly truck and TRU connections to electrical power and electricity usage for each month in the reporting year.
- Summary of maintenance and inspections conducted.
- Signed certification statement that the bond-funded project was installed and is operating as it was approved in the post-inspection and that all information submitted to the local agency is true and accurate.
- Other information as requested by the local agency.

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~~APPENDICES A-E~~
APPENDIX G

Project Specifications for FY2008-09 (Year 2) and FY2011-12 (Year 3) ~~Later~~ Funds by Source Category

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~~APPENDIX~~
A Heavy Duty Diesel Trucks
(Combines Port/Railyard and Other Trucks)

Equipment Project Specifications

~~Heavy Duty Diesel Trucks~~

Eligible Equipment	Heavy-duty diesel trucks used to move goods (a majority of the time) with a declared Gross Vehicle Weight (GVW) or declared Combined Gross Vehicle Weight (CGW) of 60,001 lbs or greater on current Department of Motor Vehicle (DMV) registration (DMV weight code "K" or higher) and a manufacturer's gross vehicle weight rating (GVWR) of 31,000 lbs or greater listed on the application and verified at pre-inspection.
	
	Equipment owner must demonstrate:
	o At least 75% operation within California for the past 2 years.
	o Registration:
	  o Continuous registration (California base-plated or California International Registration Plan (IRP)) in California for the past 2 years, or
	  o Current California registration and minimum 8 months available California DMV registration history supplemented by alternate documentation showing California operation for the past 2 years.
	  o Partial year registration may be allowed for trucks that, due to their vocation, register on a partial year basis. These trucks must have a consistent pattern of registration that establishes California operation over the past 2 years, and the pattern of operation must be consistent with the equipment owner's vocation. Mileage documentation and registration information shall be reviewed by the local agency for consistency.
	o New engines for repower or replacement projects meet the applicable Program requirements:
	  o MY2010 emissions means 0.20 g/bhp-hr or less NOx (FEL and CERT values) and 0.01 g/bhp-hr or less PM (CERT value) as certified by an ARB Executive Order for on-road use with an intended service of Heavy-Heavy Duty Diesel (HHDD) for diesel engines or Heavy Duty Otto (HDO) for applicable alternative fuel vehicles.
	  o MY2007 emissions means 1.20 g/bhp-hr or less NOx (FEL and CERT values) and 0.01 g/bhp-hr or less PM (CERT value) as certified by an ARB Executive Order for on-road use with an intended service of HHDD for diesel engines or HDO for applicable alternative fuel vehicles.
	• New or used trucks purchased for a truck replacement project have a manufacturer's GVWR of 33,001 lbs or greater (Class 8).
	
	Drayage truck owners are eligible to apply for priority drayage truck funding that may be available for truck replacement or PM + NOx retrofit projects if the owner demonstrates all of the following for the existing truck to be upgraded:
	• Meets all of the other requirements of this section.
	• Made at least 12 visits to California ports and railyards (combined) over the last 12 months.
	• **For truck replacement projects (Option 1)**, has a MY1994-2003 engine, and was registered in the California Drayage Truck Registry and was retrofitted with an ARB-verified Level 3 diesel particulate filter by June 30, 2010.
	• **For PM + NOx retrofit projects (Option 2)**, has a MY2004-2006 engine, was registered in the California Drayage Truck Registry by June 30, 2010, and would be upgraded with a PM + NOx retrofit no later than December 31, 2010.

Heavy Duty Diesel Trucks (cont.)

Ineligible Equipment	o Trucks subject to ARB's public and utility fleet rule. o Trucks subject to ARB's solid waste collection vehicle rule. o Trucks subject to ARB's diesel cargo handling equipment rule.
General Requirements (applicable to all project options)	Equipment owner shall: • Commit to the project life specified with the applicable equipment project option. • Adhere to all Program requirements during the project life. • Commit to 100% California-only operation (or 90% California-only operation for a replacement project, if that option is offered by the local agency and has been selected by the equipment owner) and California base-plated registration or California IRP. Dual plates and out-of-state registrations are prohibited, except for trucks that carry goods across the California-Mexico border which are required to be dual-plated (California and Mexico only). • Commit to at least 50% of travel within the four trade corridors for the duration of the project life. • Maintain current DMV registration with a declared GVW or CGW of 60,001 lbs or greater (DMV weight code "K" or higher) at all times during the project life. • Agree to accept an on-board electronic monitoring unit at any time during the project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain truck in good operating condition and according to manufacturer's recommendations. • Maintain collision/comprehensive insurance on the truck for replacements. • Demonstrate proof of equipment warranty on the Program-funded equipment. • Correct outstanding ARB equipment violations associated with the owner's entire fleet of vehicles. ARB will post and update information on the Program website describing the installation and operational deadlines and when the Program-funded vehicle will become eligible to be included in the equipment owner's Statewide Truck and Bus Rule fleet compliance strategy for the applicable project option.
Modifying an Application	Equipment owners may change the project option, funding option or lease-to-own program participation after the local agency solicitation period has closed if permitted by the local agency and subject to the following requirements: • The change must result in a funding amount equal to or less than the amount that was requested in the original application. • The change must result in a calculated project cost-effectiveness equal to or greater than the project listed in the original application. Equipment owners cannot substitute a different vehicle or change the ownership of the existing vehicle identified on the application after the local agency solicitation period has closed.

Heavy Duty Diesel Trucks (cont.)

Option (1) PM Retrofit	Partial funding (see options below) to retrofit an eligible MY1994-2006 heavy duty diesel engine with an ARB verified Level 3 Plus diesel particulate filter that reduces PM by 85% or more. Trucks serving ports and intermodal railyards (as indicated by the Drayage Truck Registry) are not eligible.
Funding Options	1. $5,000/truck with a project life of 2 years. Program-funded diesel particulate filter shall be installed and operational (post inspection completed) at least 6 months prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. 2. $10,000/truck with project life of 4 years. Program-funded diesel particulate filter shall be installed and operational (post inspection completed) at least 12 months prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks.
Requirements	In addition to the General Requirements listed previously, equipment owner shall: • Commit to 100% California-only operation. • Demonstrate that any mid-1990s engine subject to the software upgrades for diesel trucks (i.e., chip reflash) has completed the upgrade.
Option (2) PM + NOx Retrofit	Partial funding of up to $20,000/truck to retrofit an eligible MY2004-2006 heavy duty diesel truck engine with an ARB-verified diesel emission control strategy (VDECS) that reduces NOx exhaust emissions by an amount that meets the 2007 or 2010 Model Year NOx Emissions Equivalent and reduces diesel PM by 85% or more.
Requirements	Program-funded VDECS and diesel particulate filter shall be installed and operational (post inspection completed) at least 3 years prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. For fleets of 3 or fewer trucks subject to the Statewide Truck and Bus Rule, the equipment project shall be installed and operational at least 2 years prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. The 2007 Model Year NOx Emissions Equivalent is defined by the California Code of Regulations, Section 2025 as a 2004-2006 model year heavy-duty diesel engine equipped with a VDECS that reduces NOx exhaust emissions by at least 40% (ARB Mark 2 rating). The 2010 Model Year NOx Emissions Equivalent is defined by the California Code of Regulations, Section 2025 as a 2004-2006 model year heavy-duty diesel engine equipped with a VDECS that reduces NOx exhaust emissions by at least 85% (ARB Mark 5 rating). In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of 5 years or 500,000 miles, whichever comes first. • Commit to 100% California-only operation.

Heavy Duty Diesel Trucks (cont.)

Option (3) Repower	Partial funding of up to $30,000/truck to repower a truck with an eligible MY1994-2006 heavy duty diesel engine with a new engine that meets MY2010 emissions.
Requirements	Program-funded engine shall be installed and operational (post inspection completed, except scrappage) at least 3 years prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. For fleets of 3 or fewer trucks subject to the Statewide Truck and Bus Rule and all eligible 1999 or older trucks, the equipment project shall be installed and operational at least 2 years prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of 5 years or 500,000 miles, whichever comes first. • Commit to 100% California-only operation. • Scrap the old engine. • Purchase a minimum of a 1-year or 100,000-mile major component engine warranty for the replacement engine that covers parts and labor. • Provide a copy of ARB Executive Order documenting that the new engine meets MY2010 emissions.

Heavy Duty Diesel Trucks (cont.)

Option (4) Replacement	Partial funding (see options below) to replace 1 or 2 truck(s) equipped with eligible MY2003 or older heavy duty diesel engine(s) with a diesel or alternative fuel truck.
Funding Options (drayage trucks)	Owners of eligible drayage trucks with a MY1994-2003 engine that commit to 90% or 100% California-only operation may have the option to compete for prioritized funding as follows: 1. $50,000/truck for a replacement truck with an engine that meets MY2010 emissions. 2. $30,000/truck for a replacement truck with an engine that meets MY2007 emissions. To be eligible, the replacement truck must have less than 500,000 miles with odometer verification at the post inspection. Note: Program funding may be reduced by $15,000/truck for the replacement of trucks that were designated as "drayage" on an applicant's Program application, but could no longer access the ports or railyards because the truck did not have a retrofit installed. This option provides an alternative to installing a retrofit on an existing truck that would be scrapped after the replacement truck is purchased. Note: If priority drayage truck funding is exhausted before all eligible drayage trucks are funded, any remaining, unfunded drayage trucks will compete with other trucks.
Funding Options (other trucks)	Owners of all eligible non-drayage trucks that commit to 90% or 100% California-only operation can compete for funding as follows: 1. $60,000/truck for a replacement truck with an engine that meets MY2010 emissions. 2. $40,000/truck for a replacement truck with an engine that meets MY2007 emissions. To be eligible, the used replacement truck must have less than 500,000 miles with odometer verification at the post inspection.
Requirements	Program-funded replacement projects shall be purchased and operational (post-inspection completed, except scrappage) at least 3 years prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. For fleets of 3 or fewer trucks subject to the Statewide Truck and Bus Rule and all eligible 1999 or older trucks, the equipment project shall be installed and operational at least 2 years prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of at least 5 years or 350,000 miles (for priority drayage trucks)/500,000 miles (for other trucks), whichever comes first. • Commit to 100% California-only operation (or 90% if that option has been selected). • Scrap the old truck(s). • Purchase a minimum of a 1-year or 100,000-mile major component engine warranty for the replacement vehicle that covers parts and labor. • Provide a copy of ARB Executive Order documenting that the new truck engine meets the applicable MY2007 or MY2010 emissions.

Heavy Duty Diesel Trucks (cont.)

Option (5) Three-Way Truck Transactions	1. $60,000/truck to replace an eligible truck that has a MY1998-2006 engine (Truck A) with a diesel or alternative fuel truck (Truck C) meeting MY2010 emissions. 2. Optional $5,000/truck to equip Truck A with an ARB-verified Level 3 Plus diesel particulate filter that reduces diesel PM by 85% or more; and 3. Scrap a MY1993 or older diesel truck (Truck B) and replace with Truck A. Truck A: Heavy duty diesel truck with MY1998-2006 engine. Truck B: Heavy duty diesel truck with MY1993 or older engine. Truck C: Heavy duty truck (diesel or alternative) that meets MY2010 emissions.
Requirements	Truck C shall be purchased and operational (post inspection completed, except scrappage) at least 3 years prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. For fleets of 3 or fewer trucks subject to the Statewide Truck and Bus Rule and all eligible 1999 or older trucks, the equipment project shall be installed and operational at least 2 years prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. Truck A shall be equipped with an operational diesel particulate filter at least 6 months prior to a regulatory requirement for that technology or level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks if optional retrofit funding is received for Truck A. In addition to the applicable General Requirements listed previously, the original owner of Truck A and new owner of new Truck C shall: • Equip Truck A with an ARB verified Level 3 Plus diesel particulate filter and transfer ownership (if applicable) to the owner of old Truck B. • Commit to a project life of 5 years or 500,000 miles, whichever comes first, on Truck C. • Commit to 90% or 100% California-only operation. • Purchase a minimum of a 1-year or 100,000-mile major component engine warranty for Truck C that covers parts and labor. • Provide a copy of ARB Executive Order documenting that the new truck engine in Truck C meets MY2010 emissions. • Demonstrate that any mid-1990s engine subject to the software upgrades for diesel trucks (i.e., chip reflash) has completed the upgrade on Truck A. In addition to the applicable General Requirements listed previously, the original owner of old Truck B and new owner of retrofit Truck A shall: • Scrap Truck B. • Commit to a project life of 2 years and all applicable Program requirements on Truck A. • Commit to 100% California-only operation.

Heavy Duty Diesel Trucks (cont.)

Eligible Equipment	Truck stops, intermodal facilities, distribution centers, and other places where Class 8 heavy diesel trucks (over 33,000 lbs) congregate in a trade corridor.
Option (6) Electrification Infrastructure for Truck Stop or Distribution Center	Landside electrification infrastructure to reduce diesel engine idling and use of diesel-fueled internal combustion auxiliary power systems may be funded at the lower of 50% of eligible project costs or a level commensurate with a cost-effectiveness of 0.20 pounds of weighted emissions reduced per State dollar invested. Truck stop/distribution center electrification infrastructure projects shall be eligible to compete for funding only if the cost-effectiveness is equal or greater than 0.20 pounds of weighted emissions reduced per State dollar invested. Eligible costs include purchase and installation of electrical infrastructure to: enable heating, cooling, and the use of cab power for parked trucks at truck stops; and enable the use of power for transport refrigeration units and auxiliary power systems at distribution centers, intermodal facilities, and other places where trucks congregate. Reimbursement for the eligible costs shall be based on demonstrated use over the first year of operation. Ineligible costs include on-board auxiliary power units and other equipment installed on trucks, transport refrigeration units, electricity costs and operation and maintenance costs.
Requirements	In addition to the General Requirements listed previously, equipment owner shall: • Commit to 10 years of operation. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty. • Comply with all local permitting requirements.
Project Cost Assumptions	• Option (1): Average cost of a diesel particulate filter is ~$15,000. • Option (2): Total cost of a NOx+PM retrofit is expected to be $40,000. • Option (3): Total cost of a repower project is expected to be $60,000. • Option (4,5): Total cost of a new MY2010 compliant truck is ~$120,000 (diesel) to ~$180,000 (natural gas). Total cost of a used MY2007 truck (in 2011-2012) is expected to be $60,000-$80,000 (diesel). • Option (6): Total cost for distribution centers is $1,500-$7,000/plug at dock; $2,500-$9,000/plug in parking areas; $500-$2,000/adapter for trailers and TRUs. Total cost for truck stops is $6,000-$18,000/parking space; $3,000/truck modification.

~~APPENDIX~~ B Locomotives and Railyards

Equipment Project Specifications

~~Locomotives and Railyards~~

Eligible Equipment	**Locomotive projects:** Diesel-powered freight locomotives with no or minimal emissions control technology (i.e., uncontrolled, or meeting Tier 0 or Tier 1 standards). Equipment owner must demonstrate: • Operation or equivalent locomotive horsepower operation in California for the past 2 years. • At least 50% operation or equivalent locomotive horsepower operation within trade corridor(s) for the past 2 years. • Estimated diesel fuel usage of 20,000 gallons per year or greater. **Railyard projects:** Existing freight railyards in a trade corridor.
General Requirements (applicable to all project options)	Equipment owner shall: • Commit to the project life specified with the applicable equipment project option. • Adhere to all Program Requirements during the project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and insurance on upgraded equipment. • Certify that there are no outstanding ARB violations associated with the equipment or owner. • Exclude any Program-funded equipment from the compliance calculations for the 1998 agreement for Locomotives in the South Coast Air Basin for the duration of the project life (applicable to UP and BNSF only). Equipment owners participating in a 90% California operation option may compete at a funding level that is 20% less than the applicable funding option described below, and must do the following at their own expense: (1) install an approved, active GPS device in the funded locomotive; (2) pay for monthly electronic service for the project life; and (3) provide electronic monitoring and activity reports when requested by the local agency or ARB, in the format defined by ARB staff.

Locomotives and Railyards (cont.)

Option (1): Switcher Locomotive (1,006 hp - 2,300 hp)	Partial funding (see options below) to replace, repower, or rebuild an uncontrolled, Tier 0, or Tier 1 switcher locomotive with a new generator-set, hybrid, or alternative technology.
Funding Options	1. The lower of 50% of the eligible cost or $750,000/locomotive to meet emission limits of 3.5 g/bhp-hr or less for NOx and 0.10 g/bhp-hr or less for PM. 2. $1,000,000/locomotive to meet U.S. EPA Tier 4 or lower emission standards for NOx only or PM only. 3. $1,200,000/locomotive to meet U.S. EPA Tier 4 or lower emission standards for both NOx and PM. Eligible costs include a new chassis, freshly manufactured engine(s), diesel PM filter, selective catalytic reduction device for NOx control, and mechanical/electrical systems components necessary for safe operation. Ineligible costs include auto start/stop devices required by regulation or agreements, GPS units and associated monitoring and reporting costs, design, engineering, consulting, license, registration, taxes, insurance, operation, maintenance, and repair.
Requirements	The new equipment must meet the required emission levels or standards as evidenced by an ARB verified U.S. EPA engine certification test results (funding Option 1 only) or a U.S. EPA Certificate of Conformity (funding Options 1, 2, or 3) under the switcher duty-cycle. In addition to the General Requirements, equipment owner shall: • Be permitted to have equipment temporarily travel out-of-state for periodic maintenance if outlined in the contract between the local agency and equipment owner. • Commit to a project life of 15 years. • Commit to 90% or 100% operation within the four California trade corridors for the duration of the project life. • Scrap or ban old engine/locomotive from California operation. • Install an active GPS unit on both old (if not scrapped) and new equipment, fund data collection, and report location data.

Locomotives and Railyards (cont.)

Option (2): (Medium Horsepower) Line-haul Locomotive (2,301 hp - 4,000 hp)	Partial funding (see options below) to replace, repower, or rebuild an uncontrolled, Tier 0, or Tier 1 line-haul locomotive with a new engine or alternative technology.
Funding Options	1. The lower of 50% of the eligible cost or $750,000/locomotive to meet emission limits of 4.0 g/bhp-hr or less for NOx and 0.10 g/bhp-hr or less for PM. 2. $1,000,000/locomotive to meet U.S. EPA Tier 4 or lower emission standards for NOx only or PM only. 3. $1,500,000/locomotive to meet U.S. EPA Tier 4 or lower emission standards for both NOx and PM. Eligible costs include a new chassis, freshly manufactured or rebuilt engine(s), diesel PM filter, selective catalytic reduction device for NOx control, other emission control equipment, and new or upgraded mechanical/electrical/control system components necessary for safe operation. Ineligible costs include auto start/stop devices required by regulation or agreements, GPS units and associated monitoring and reporting costs, design, engineering, consulting, license, registration, taxes, insurance, operation, maintenance, and repair.
Requirements	The new equipment must meet the required emission levels or standards as evidenced by an ARB verified U.S. EPA engine certification test results (funding Option 1 only) or a U.S. EPA Certificate of Conformity (funding Options 1, 2 or 3) under the line-haul duty-cycle. In addition to the General Requirements listed previously, equipment owner shall: • Be permitted to have equipment temporarily travel out-of-state for periodic maintenance if outlined in the contract between the local agency and equipment owner. • Commit to a project life of 15 years. • Commit to 90% or 100% California-only operation for the duration of the project life. The funded intrastate line-haul locomotive shall use California ARB diesel fuel. • Commit to at least 50% of operation within the four California trade corridors for duration of the project life. • Scrap or ban old engine/locomotive from California operation. • Install an active GPS unit on both old (if not scrapped) and new equipment, fund data collection, and report location data.

Locomotives and Railyards (cont.)

Option (3): Line-Haul Locomotive (4,001 hp or higher)	Partial funding (see options below) to replace, repower, or rebuild an uncontrolled, Tier 0, or Tier 1 line-haul locomotive with a new engine or alternative technology.
Funding Options	1. The lower of 50% of the eligible cost or $1,200,000/locomotive to meet U.S. EPA Tier 3 or lower emission standards for both NOx and PM through use of a Tier 3 engine or Tier 2 engine with certified "Tier 2 Plus" kit. 2. $1,500,000/locomotive to meet U.S. EPA Tier 4 or lower emission standards for NOx only or PM only. 3. $2,000,000/locomotive to meet U.S. EPA Tier 4 or lower emission standards for both NOx and PM. Eligible costs include a new chassis, freshly manufactured or rebuilt engine(s), new Tier 2 engine(s), a U.S. EPA Certified "Tier 2 Plus" retrofit kit, new generator set(s), diesel PM filter, selective catalytic reduction device for NOx control, other emission control equipment, and new or upgraded mechanical/electrical/control system components necessary for safe operation. Ineligible costs include auto start/stop devices required by regulation or agreements, GPS units and associated monitoring and reporting costs, design, engineering, consulting, license, registration, taxes, insurance, operation, maintenance, and repair.
Requirements	The new equipment must meet the required emission standards as evidenced by a U.S. EPA Certificate of Conformity under the line-haul duty-cycle. Any equipment project which utilizes a "Tier 2 Plus" retrofit kit must have the post-inspection completed (except scrappage) by December 31, 2012. In addition to the General Requirements listed previously, equipment owner shall: • Be permitted to have equipment temporarily travel out-of-state for periodic maintenance if outlined in the contract between the local agency and equipment owner. • Commit to a project life of 15 years. • Commit to 90% or 100% California-only operation for the duration of the project life. The funded intrastate line-haul locomotive shall use California ARB diesel fuel. • Commit to at least 50% of operation within the four California trade corridors for the duration of the project life. • Scrap or ban old engine/locomotive from California operation. • Install an active GPS unit on both old (if not scrapped) and new equipment, fund data collection, and report location data.
Project Cost Assumptions	• Estimated total cost of new switcher generator-set is ~$1.5-$2 million. • Estimated cost for a line-haul repower is ~$1-$2 million. • Estimated total cost of a new line-haul locomotive is ~$2-$3 million. • Estimated cost of a "Tier 2 Plus" retrofit device kit is ~$250,000.

Locomotives and Railyards (cont.)

Option (4): Locomotive Emissions Capture and Control System	Partial funding for the lower of 50% of eligible costs or a level commensurate with a cost-effectiveness of at least 0.15 ~~lbs/State dollar~~ pounds of weighted emissions reduced per State dollar invested for the purchase and installation of an ARB-approved locomotive emission capture and control system (a.k.a. hood or bonnet) to reduce diesel PM and NOx emissions from freight locomotives. Eligible costs include purchase and installation of the emission treatment system and ducting, and hoods or bonnets necessary to connect to locomotives. Ineligible costs include those associated with increasing the capacity of electrical power to the facility, locomotive modifications to accept capture and control system, locomotive or other acquisition and modification for a portable system, design, engineering, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, utility construction or metered costs, insurance, operation, maintenance, and repair.
Requirements	In addition to the General Requirements listed previously, equipment owner shall: • Commit to a project life of 10 years. • Commit to 90% or 100% operation within the four California trade corridors for the duration of the project life. • Document the system is commercially available and achieves an overall capture and control efficiency rate of at least 85% for the removal of NOx and PM. • Demonstrate system performance and efficiency with source testing prior to funding and annually thereafter by capturing emissions from an operating locomotive undergoing diagnostic procedures. Performance measures include: (i) no visible emissions after bonnet is connected to the locomotive (opacity <20%); and (ii) establish overall system efficiency rate is at least 85% using ARB approved methods for flow rate (Methods 1 to 4), NOx (ARB Method 100) and PM (ARB Method 5). Any alternative test methods must be approved by ARB. • Obtain a 10-year manufacturer's warranty (including labor and materials) to repair and/or replace system component(s) as needed to correct any mechanical, electrical or control system equipment or installation problems which may cause significant loss of capture, treatment efficiency or usability. The manufacturer's warranty may exclude minor items that are subject to normal wear and tear if approved by ARB. • Comply with all local permitting requirements.
Excluded Funding Components	• Electricity costs required to operate the hood control system. • Other operation and maintenance costs.
Project Cost Assumptions	• Estimated total cost of new switcher generator-set is ~$1.5-$2 million. • Estimated cost for a line-haul repower is ~$1-$2 million. • Estimated total cost of a new line-haul locomotive is ~$2-$3 million. • Estimated cost of a "Tier 2 Plus" retrofit device kit is ~$250,000. • Estimated capital cost for the locomotive emissions capture and control system of one 12,500 scfm unit with 12 bonnets is ~$9 million.

~~APPENDIX~~
C Ships at Berth

Equipment Project Specifications

~~Ships at Berth~~

Eligible Equipment	Existing cargo ship berth or existing cargo ship terminal at a seaport located in a trade corridor.
General Requirements (applicable to all project options)	Equipment owner shall: • Commit to the project life specified with the applicable equipment project option. • Adhere to all Program requirements during the project life. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency and the port (if not the same entity) including project milestone and completion deadlines. • If the equipment owner is also the local agency administering the grant, the local agency must sign a legally binding contract with ARB including project milestone and completion deadlines. • Properly maintain all equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and insurance on new equipment. • Comply with local permitting requirements. • Comply with the Supplemental Procedures available on the Program website.
Option (1) Grid-Based Power	Partial funding up to the lower of 50% of eligible shore-side costs to install permanent, grid-based electrical power at a cargo ship berth or: 1. $3,500,000/berth for completed projects that begin operation by January 2012. 2. $3,000,000/berth for completed projects that begin operation by January 2013. 3. $2,500,000/berth for completed projects that begin operation by January 2014. For purposes of determining the funding level only, a berth may be considered complete and operational if a successful system test is completed and approved by the local agency. System testing procedures shall be approved by ARB. Up to 80% of eligible project costs are authorized for early reimbursement in accordance with the requirements of Chapter IV. B.2.e. Final payments, including any project funds held in retention, are paid upon completion of a satisfactory post-inspection. Eligible costs include design, engineering, equipment necessary to purchase and install infrastructure to supply electrical power, utility construction, and costs associated with increasing the capacity of electrical power to the port. Ineligible costs include shipside modifications to accept shore-based electrical power, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, metered costs, insurance, operation, maintenance, and repair.

Requirements	In addition to the General Requirements listed previously, equipment owner shall:
	• Commit to a project life of 10 years for the use of grid-based shore power at the berth at the following levels or greater:
	  ○ 50% of the ship visits in 2012-2013, if applicable.
	  ○ 60% of the ship visits in 2014-2016.
	  ○ 80% of the ship visits in 2017-2019.
	  ○ 90% of the ship visits in 2020 and beyond.
	• Demonstrate operability with a cargo ship fully powered by shore-based electrical power supplied by the grid-based equipment.

Ships at Berth (cont.)

Option (2) Non-Grid-Based Power	Partial funding of up to $200,000 per megawatt of the eligible costs of an electricity generating unit that provides power at a cargo ship berth or multiple berths. This unit can be portable or fixed on the terminal. Only zero emission units (e.g., fuel cell, solar), or natural gas engines equipped with selective catalytic reduction to control NOx emissions are eligible. Eligible costs include equipment necessary to generate electrical power and connect the equipment to cargo ships at berth. Ineligible costs include construction and protection of infrastructure (e.g., natural gas lines) used to supply fuel for non-grid-based electrical generation, shipside modifications to accept electrical power, barge or other acquisition and modification for a portable system, design, engineering, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, utility construction or metered costs, insurance, operation, maintenance, and repair.

Requirements	In addition to the General Requirements listed previously, equipment owner shall:
	• Commit to a project life of 5 years of 100% California operation at the following levels or greater:
	  ○ Port of Los Angeles and Port of Long Beach:
	  ▪ 2,000 hours per year in 2012-2013.
	  ▪ 3,000 hours per year in 2014 and beyond.
	  ○ All other ports in the four trade corridors:
	  ▪ 1,000 hours per year in 2012-2013.
	  ▪ 1,500 hours per year in 2014 and beyond.
	• Demonstrate operability with a cargo ship fully powered by shore-based electrical power supplied by the electricity generating unit.
	• Obtain a 5 year manufacturer's warranty which includes labor and materials to repair and/or replace system component(s) as needed to correct any mechanical, electrical or control system equipment or installation problems resulting in significant loss of usability. The manufacturer's warranty may exclude minor items that are subject to normal wear and tear if approved by ARB.
	• Perform source testing to measure emissions from the unit every 1,000 hours of operation, according to the source test requirements contained in ARB's Ships at Berth Rule.

Ships at Berth (cont.)

Option (3) Ship Emissions Capture and Control System Requirements	Partial funding of up to the lower of 50% of the eligible costs or a level commensurate with a cost-effectiveness of at least 1.0 lbs/State dollar for the purchase and installation of a ship emissions capture and control system (a.k.a. hood or bonnet) to reduce diesel PM and NOx emissions at 85% from ships at berth. Only units that have ARB-approved capture and treatment efficiency rates for PM and NOx consistent with ARB's Ships At-Berth Rule are eligible for funding.
	Eligible costs include purchase and installation of the emission treatment system and ducting, and hoods or bonnets necessary to connect to cargo ships at berth.
	Ineligible costs include shipside modifications to accept capture and control system, barge or other acquisition and modification for a portable system, design, engineering, consulting, environmental review, legal fees, permits, licenses and associated fees, taxes, utility construction or metered costs, insurance, operation, maintenance, and repair.
	In addition to the General Requirements listed previously, equipment owner shall:
	• Commit to a project life of 10 years of 100% California operation at the following levels or greater:
	  ○ Port of Los Angeles and Port of Long Beach:
	  ▪ 2,000 hours per year in 2012-2013.
	  ▪ 3,000 hours per year in 2014-2016.
	  ▪ 4,000 hours per year in 2017-2019.
	  ▪ 4,500 hours per year in 2020 and beyond.
	  ○ All other ports in the four trade corridors:
	  ▪ 1,000 hours per year in 2012-2013.
	  ▪ 1,500 hours per year in 2014-2016.
	  ▪ 2,000 hours per year in 2017-2019.
	  ▪ 2,500 hours per year in 2020 and beyond.
	• Commit to 100% operation within the four California trade corridors for the duration of the project life.
	• Document the system is commercially available and achieves an overall efficiency rate of at least 85% for the capture and removal of NOx and PM.
	• Demonstrate system performance and efficiency with source testing prior to funding and annually thereafter by capturing emissions from a cargo ship at port. Performance measures include: (i) no visible emissions after bonnet is connected to the locomotive (opacity <20%); and (ii) establish overall system efficiency rate is at least 85% using ARB approved methods for flow rate (Methods 1 to 4), NOx (ARB Method 100), and PM (ARB Method 5). Any alternative test methods must be approved by ARB.
	• Obtain a 10 year manufacturer's warranty (including labor and materials) to repair and/or replace system component(s) as needed to correct any mechanical, electrical or control system equipment or installation problems which may cause significant loss of capture, treatment efficiency or usability. The manufacturer's warranty may exclude minor items that are subject to normal wear and tear if approved by ARB.

Project Cost Assumptions	• Option (1): Total shore-side cost of equipping a berth with permanent grid-based electrical power is ~$3-$5 million/berth; some ports may incur higher costs to bring new/additional power capacity to the port that may increase the total cost to $5-$7 million/berth. • Option (2): Total cost of distributed generation power is anticipated to be $4 million/2 MW unit. • Options (1) & (2): Shipside modifications will cost ~$500,000-$1 million/ship. • Option (3): Ship emissions capture and control system estimated capital cost is approximately $6 million for the current standard design of one 12,500 scfm unit with single bonnet.

~~APPENDIX~~ D Commercial Harbor Craft

Equipment Project Specifications

~~Commercial Harbor Craft~~

Eligible Equipment	Existing commercial diesel harbor craft vessels involved in goods movement with: a home port located in a trade corridor, 2 years of operation in California waters, Tier 0 or Tier 1 diesel propulsion engine(s) for repower or replacement projects and Tier 2 or Tier 3 diesel propulsion engines for hybrid projects. Eligible vessel types include: • Tugboats and towboats. • Crew and supply vessels. • Work boats. • Pilot vessels. • Commercial fishing boats with at least 700 operational hours per year. These vessel types are defined in section 93118.5, title 17, chapter 1, subchapter 7.5, California Code of Regulations (d) Definitions.
General Requirements (applicable to all project options)	Equipment owner shall: • Commit to 8 years of California home port operation in the trade corridors. • Scrap old engine or vessel (as applicable). • Agree to accept an electronic monitoring unit at any time during the project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Demonstrate proof of insurance on upgraded or replaced equipment. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Certify that there are no outstanding ARB violations associated with the equipment or the owner. Equipment owners participating in a 90% California operation option may compete at a funding level that is 20% less than the applicable funding option described below, and must do the following at their own expense: (1) install an approved, active GPS system in the funded vessel; (2) pay for monthly electronic service for the project life; and (3) provide electronic monitoring and activity reports when requested by the local agency or ARB, in the format defined by ARB staff.

Commercial Harbor Craft (cont.)

Option (1) Repower/ Replacement of Tugboats/ Towboats, Crew and Supply Vessels	Partial funding of up to the lower of 50% of the eligible cost or $140/horsepower of the old engine to repower or replace an eligible tugboat, towboat, crew and supply vessel* equipped with a Tier 0 or Tier 1 propulsion engine with a Tier 2 or Tier 3 engine as described in the project options. Available project options: 1. Repower an existing Tier 0 propulsion engine with a new engine meeting the latest emission standards (Tier 2 or Tier 3) and make necessary vessel modifications to accommodate the new engine. 2. Replace a vessel with an existing Tier 0 propulsion engine(s) with a new vessel powered by an engine meeting the latest emission standards (Tier 2 or Tier 3). 3. Repower an existing Tier 1 propulsion engine with a new engine meeting the Tier 3 emission standard and make necessary vessel modifications to accommodate the new engine. 4. Replace a vessel with an existing Tier 1 propulsion engine(s) with a new vessel powered by an engine(s) meeting the Tier 3 emission standard. 5. In addition to any one of these options, also retrofit the upgraded vessel with a hybrid system (see Option 3). Eligible costs include purchase of replacement vessel (diesel or hybrid) or purchase and installation of a new engine or hybrid system including vessel modifications directly related to the new engine or system. Ineligible costs include out of service time (dry dock) costs, fuel, design, engineering, consulting, legal fees, license, registration, taxes, insurance, operation, maintenance, and repair. *Note: If the Board does not adopt Rule amendments that require upgrades on existing crew and supply vessels, these vessels would be eligible for funding under Option 2.
Additional Requirements	Program-funded engine repower and vessel replacement projects shall be operational (post inspection completed, except scrappage) at least 2 years prior to any regulatory requirement for that technology or level of emissions control.
Option (2) Repower/ Replacement of Other Vessels	Partial funding of up to the lower of 80% of the eligible cost or $190/horsepower of the old engine to repower or replace an eligible other vessel equipped with a Tier 0 or Tier 1 propulsion engine with a Tier 2 or Tier 3 engine as described in the project options. Other vessel types may include work boats or pilot vessels involved in goods movement and high use commercial fishing vessels. Available project options: 1. Repower an existing Tier 0 or Tier 1 propulsion engine with a new engine meeting the latest emission standards (Tier 2 or Tier 3) and make necessary vessel modifications to accommodate the new engine. 2. Replace a vessel with an existing Tier 0 or Tier 1 propulsion engine(s) with a new vessel powered by an engine(s) meeting the latest emission standards (Tier 2 or Tier 3). Eligible costs include purchase of replacement vessel (diesel or hybrid) or purchase and installation of a new engine or hybrid system including vessel modifications directly related to the new engine or system. Ineligible costs include out of service time (dry dock) costs, fuel, design, engineering, consulting, legal fees, license, registration, taxes, insurance, operation, maintenance, and repair.

Commercial Harbor Craft (cont.)

Option (3) Retrofit/ Replacement with Hybrid Power System	Partial funding of up to the lower of 80% of the eligible cost or $100/horsepower of the old engine for a hybrid power system that reduces PM and NOx emissions by 30% through retrofit or replacement of an eligible tugboat, towboat, or crew and supply vessel. An equipment owner may receive a grant to repower/replace a vessel (under Option 1) and to add a hybrid power system on the same upgraded vessel Available project options: 1. Retrofit an existing vessel with Tier 2 or Tier 3 propulsion engine(s) with a hybrid power system, and make necessary vessel modifications to accommodate the new hybrid system. 2. Replace an existing vessel with a new vessel powered by a hybrid system that includes Tier 2 or Tier 3 propulsion engine(s). Eligible costs include purchase of replacement vessel (diesel or hybrid) or purchase and installation of a new engine or hybrid system including vessel modifications directly related to the new engine or system. Ineligible costs include out of service time (dry dock) costs, fuel, design, engineering, consulting, legal fees, license, registration, taxes, insurance, operation, maintenance, and repair.
Additional Requirements	• The hybrid power system must include a manufacturer's warranty for a minimum period of 8 years. • Project eligibility is subject to an ARB staff determination that a hybrid power system installed on a vessel with Tier 2 propulsion engines reduces PM and NOx emissions by at least 30% each, compared to a similar vessel with Tier 2 propulsion engines, the same operating hours, and a similar duty cycle, but without the hybrid system.
Project Cost Assumptions	• Total cost of a Tier 2 engine is estimated at $230/hp. • Total cost of a Tier 3 engine is estimated at $290-$350/hp. • Total cost to repower a vessel with a hybrid power system is estimated at $300-$350/hp. The incremental cost is of hybrid power system is estimated at $60-$120/hp.

~~APPENDIX~~ E Cargo Handling Equipment

Equipment Project Specifications

~~Cargo Handling Equipment~~

Eligible Equipment	Existing diesel-powered rubber-tired gantry (RTG) crane, or diesel-powered yard truck with MY2004-2006 off-road diesel engine, operating at a seaport or intermodal railyard in a trade corridor.
General Requirements (applicable to all project options)	• Agree to accept an on-board electronic monitoring unit at any time during the project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty for the project life and insurance on upgraded equipment.
Option (1) Repower RTG Crane w/ Electric or Zero-Emission Power System	Partial funding of up to the lower of 50% of the eligible cost or $100,000/crane to repower the diesel engine with an electric or zero-emission power system. Eligible costs include purchase and installation of a new electric engine and necessary parts for an existing RTG crane including directly related vehicle modifications. Ineligible costs include design, engineering, consulting, legal fees, license, registration, taxes, insurance, operation, maintenance, and repair.
Requirements	Equipment owner shall: • Commit to 15 years of 100% California operation in port or intermodal railyard service in trade corridors. • Agree to accept an on-board electronic monitoring unit at any time during the project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty for the project life and insurance on upgraded equipment. • Comply with all local permitting requirements. • Certify that there are no outstanding ARB violations associated with the equipment or the owner.

Cargo Handling Equipment (cont.)

Option (2) Electric or Zero-Emission Yard Truck	Partial funding of up to the lower of 50% of the eligible cost or $50,000/truck to replace a yard truck equipped with MY2004-2006 off-road diesel engine with a new electric or zero-emission yard truck. Eligible costs include purchase of a new electric or zero-emission yard truck. Ineligible costs include license, registration, taxes (other than federal excise and sales tax), insurance, operation, maintenance, and repair.
Requirements	Project needs to achieve 2 years of early reductions. For fleets of 1-3 trucks, this means the project needs to be operational 2 years before the applicable compliance date. For larger fleets, this means the Program-funded truck is not eligible to be counted as a compliant truck in the fleet percentage calculations for a 2-year period. Equipment owner shall: • Commit to 5 years of 100% California operation in port or intermodal railyard service in trade corridors. • Agree to accept an on-board electronic monitoring unit at any time during the project life. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty for the project life and insurance on upgraded equipment. • Certify that there are no outstanding ARB violations associated with the equipment or the owner.
Project Cost Assumptions	• Total estimated cost of repowering an existing RTG crane with an electric power system is between $330,000-$590,000/crane. • Total estimated cost of an electric yard truck is ~$190,000, with an incremental cost (above a complying diesel engine) of ~$100,000.

APPENDIX H

Project Specifications for FY2007-08 (Year 1) Funds by Source Category

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A. Trucks Serving Ports and Intermodal Railyards

Equipment Project Specifications

~~Trucks Serving Ports and Intermodal Railyards~~	
Eligible Equipment	Class 8 (>33,000 lbs gross vehicle weight rating) heavy-duty diesel trucks used to move goods. Equipment owner must demonstrate: • Continuous registration (California base-plated or California International Registration Plan (IRP)) in California for the past 2 years, or • Partial year registration - a pattern of monthly or seasonal registration or other approved documentation that establishes California operation over the past 2 years. A minimum of 10,000 vehicle miles traveled (VMT) per year during each of the past 2 years is required to be eligible for this option. • At least 50% operation within trade corridor(s) for the past 2 years.
Ineligible Equipment	• Trucks subject to ARB's public and utility fleet rule. • Trucks subject to ARB's solid waste collection vehicle rule. • Trucks subject to ARB's diesel cargo handling equipment rule.
Option (1) Retrofit **Requirements**	Partial funding of up to $5,000/truck to retrofit an eligible MY2006 or older heavy duty diesel truck with an ARB verified Level 3 diesel particulate filter that reduces diesel PM by 85% or more. • Program-funded diesel particulate filter shall be installed and operational at least 6 months prior to a regulatory requirement for that technology or level of emissions control. Equipment owner shall: • Commit to at least 2 years of 100% California-only operation and California base-plated registration. Dual plates, IRP, and any other out-of-state registrations are prohibited. • Commit to at least 2 years of frequent port or inter-modal railyard service (150+ visits/year). • Commit to at least 50% of travel in trade corridors for duration of contract term. • Agree to accept an on-board electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain filter in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty on filter. • Demonstrate that any mid-1990s engine subject to the software upgrades for diesel trucks (i.e., chip reflash) has completed the upgrade. • Certify that there are no outstanding ARB equipment violations associated with the equipment project application.

Trucks Serving Ports and Intermodal Railyards (cont.)

Option (2) Repower	The lower of 50% or $20,000 to repower an eligible MY2003 or older heavy duty diesel truck with a new engine that meets MY2007 emission levels or lower and ARB's requirements for engine manufacturer diagnostics.
Requirements	• Program-funded truck repower project shall be completed and operational at least 3 years prior to a regulatory requirement for that technology or level of emissions control. For independent owner operators, the equipment project shall be completed and operational at least 2 years prior to a regulatory requirement for that technology or level of emissions control. Equipment owner shall: • Commit to at least 5 years or 350,000 miles of 100% California-only operation and California base-plated registration. Dual plates, IRP, and any other out-of-state registrations are prohibited. • Commit to at least 4 years of frequent port or intermodal railyard service (150+ visits/year). • Commit to at least 50% of travel in trade corridors for duration of contract term. • Agree to accept an on-board electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Scrap the old engine. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain new engine, emission controls, and diagnostics in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and comprehensive insurance on upgraded equipment. • Provide a copy of ARB Executive Order documenting that the new truck engine meets 2007 emission levels. • Certify that there are no outstanding ARB equipment violations associated with the equipment project application.

Trucks Serving Ports and Intermodal Railyards (cont.)

Option (3) Replacement	Partial funding of up to $50,000/truck to replace an eligible MY2003 or older heavy duty diesel truck with a diesel or alternative fuel truck meeting MY2007 emission levels or lower.
Requirements	• Program-funded truck replacement project shall be completed and operational at least 3 years prior to a regulatory requirement for a truck meeting MY2007 emission standards. For independent owner operators, the new truck must be operational at least 2 years prior to a regulatory requirement for a truck meeting MY2007 emission standards. Equipment owner shall: • Commit to at least 5 years or 350,000 miles of 100% California-only operation and California base-plated registration. Dual plates, IRP, and any other out-of-state registrations are prohibited. • Commit to at least 4 years of frequent port or intermodal railyard service (150+ visits/year). • Commit to at least 50% of travel in trade corridors for duration of contract term. • Agree to accept an on-board electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Scrap the old truck. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. Under a lease program, the owner and lessee must sign the contract. • Properly maintain new truck in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and comprehensive insurance on new truck. • Provide copy of ARB Executive Order documenting that the new truck engine meets 2007 emission levels. • Certify that there are no outstanding ARB equipment violations associated with the equipment project application.
Project Cost Assumptions	• Option (1): Total cost of a diesel particulate filter is ~$10,000. • Option (2): Total average cost of a repower is ~$40,000. • Options (3) & (4): Total cost of a new MY2007 truck is ~$100,000 (diesel) to ~$180,000 (natural gas).

B. Other Heavy Duty Diesel Trucks

Equipment Project Specifications

~~Other Heavy Duty Diesel Trucks~~	
Eligible Equipment	Class 8 (>33,000 lbs gross vehicle weight rating) heavy-duty diesel trucks used to move goods. Equipment owner must demonstrate: • Continuous registration (California base-plated or California IRP) in California for the past 2 years, or • Partial year registration - a pattern of monthly or seasonal registration or other approved documentation that establishes California operation over the past 2 years. A minimum of 10,000 vehicle miles traveled (VMT) per year during each of the past 2 years is required to be eligible for this option. • At least 50% operation within trade corridor(s) for the past 2 years.
Ineligible Equipment	• Trucks subject to ARB's public and utility fleet rule. • Trucks subject to ARB's solid waste collection vehicle rule. • Trucks subject to ARB's diesel cargo handling equipment rule. • A truck funded via a contract executed after adoption of the *Regulation to Reduce Emissions of Diesel Particulate Matter, Oxides of Nitrogen and Other Criteria Pollutants, and Greenhouse Gases from In-Use Heavy-Duty Diesel-Fueled Vehicles* must comply with the additional restrictions on fleet averaging included in these Guidelines.

Other Heavy Duty Diesel Trucks (cont.)

Option (1) Retrofit	Partial funding of up to $5,000/truck to retrofit an eligible MY2006 or older heavy duty diesel truck with an ARB verified Level 3 diesel particulate filter that reduces diesel PM by 85% or more.
Requirements	• Program-funded diesel particulate filter shall be installed and operational at least 6 months prior to a regulatory requirement for that level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. In this 6 month time period, a truck funded under this Program is not eligible to be included in any fleet averaging. Equipment owner shall: • Commit to at least 2 years of 100% California-only operation and California base-plated registration. Dual plates, IRP, and any other out-of-state registrations are prohibited. • Commit to at least 50% of travel in trade corridors for duration of contract term. • Agree to accept an on-board electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain filter in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty on filter. • Demonstrate that any mid-1990s engine subject to the software upgrades for diesel trucks (i.e., chip reflash) has completed the upgrade. • Certify that there are no outstanding ARB equipment violations associated with the equipment project application.

Other Heavy Duty Diesel Trucks (cont.)

Option (2) Repower	The lower of 50% or $20,000 to repower an eligible MY2003 or older heavy duty diesel truck with a new engine that meets MY2007 emission levels or lower and ARB's requirements for engine manufacturer diagnostics.
Requirements	• Program-funded truck repower projects shall be completed and operational at least 3 years prior to a regulatory requirement for that level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. In this 3 year period, a truck funded under this Program is not eligible to be included in any fleet averaging. For independent owner operators and owners of all eligible MY1997 or older trucks, the equipment project shall be completed and operational at least 2 years prior to a regulatory requirement for that level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. Equipment owner shall: • Commit to at least 5 years or 500,000 miles of 100% California-only operation and California base-plated registration. Dual plates, IRP, and any other out-of-state registrations are prohibited. • Commit to at least 50% of travel in trade corridors for duration of contract term. • Agree to accept an on-board electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Scrap the old engine. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain new engine, emission controls, and diagnostics in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and comprehensive insurance on upgraded equipment. • Provide copy of ARB Executive Order documenting that the new truck engine meets 2007 emission levels. • Certify that there are no outstanding ARB equipment violations associated with the equipment project application.

Other Heavy Duty Diesel Trucks (cont.)

Option (3) Replacement	Partial funding of up to $50,000/truck to replace an eligible MY2003 or older heavy duty diesel truck with a diesel or alternative fuel truck meeting MY2007 emission levels or lower.
Requirements	• Program-funded truck replacement projects shall be completed and operational at least 3 years prior to a regulatory requirement for that level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. In this 3 year period, a truck funded under this Program is not eligible to be included in any fleet averaging. For independent owner operators and owners of all eligible MY1997 or older trucks, the equipment project shall be completed and operational at least 2 years prior to a regulatory requirement for that level of emissions control under the best available control technology provisions of any adopted rule for in-use trucks. Equipment owner shall: • Commit to at least 5 years or 500,000 miles of 100% California-only operation and California base-plated registration. Dual plates, IRP, and any other out-of-state registrations are prohibited. • Commit to at least 50% of travel in trade corridors for duration of contract term. • Agree to accept an on-board electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Scrap the old truck. • Comply with record-keeping, reporting, and audit requirements • Sign a legally binding contract with the local agency including project milestone and completion deadlines. Under a lease program, the owner and lessee must sign the contract. • Properly maintain new truck in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and comprehensive insurance on new truck. • Provide copy of ARB Executive Order documenting that the new truck engine meets 2007 emission levels. • Certify that there are no outstanding ARB equipment violations associated with the equipment project application.

Other Heavy Duty Diesel Trucks (cont.)

Additional Requirements for Eligible Equipment	Truck A: MY2003-2006 heavy duty diesel truck. Truck B: MY1990 or older heavy duty diesel truck.
Option (4) Three-Way Truck Transactions	Partial funding of up to $50,000/transaction to: 1. Replace an eligible MY2003-2006 truck (Truck A) with a diesel or alternative fuel truck (Truck C) meeting MY2007 emissions levels or lower; and 2. Equip Truck A with an ARB-verified Level 3 diesel particulate filter that reduces diesel PM by 85% or more; and 3. Scrap a MY1990 or older diesel truck (Truck B) and replace with Truck A.
Requirements	• Program-funded three-way truck transaction shall be completed and the new truck operational at least 2 years prior to a regulatory requirement for a truck meeting MY2007 emission standards under the best available control technology provisions of any adopted rule for in-use trucks. In this 2 year period, a truck funded under this Program is not eligible to be included in any fleet averaging. If the original owner of Truck A and new owner of Truck C is an independent owner operator, Truck C must be operational at least 2 years prior to a regulatory requirement for a truck meeting MY2007 emission standards. • Truck A shall be equipped with a diesel particulate filter at least 6 months prior to a regulatory requirement for a Level 3 PM device under the best available control technology provisions of any adopted rule for in-use trucks. Original owner of Truck A and new owner of new Truck C shall: • Equip Truck A with a Level 3 diesel particulate filter and transfer ownership (if applicable) to the owner of old Truck B. • On Truck C, commit to at least 5 years or 500,000 miles of 100% California-only operation and California base-plated registration. Dual plates, IRP, and any other out-of-state registrations are prohibited. • On Truck C, commit to at least 50% of travel in trade corridors for duration of contract term. • Agree to accept an on-board electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain new truck in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and comprehensive insurance on new truck. • Provide copy of ARB Executive Order documenting that Truck C engine meets 2007 emission levels, and the Truck A is certified for sale in California. • Certify that there are no outstanding ARB equipment violations associated with any of the trucks involved in the equipment project.

Other Heavy Duty Diesel Trucks (cont.)

Option (4) Three-Way Truck Transactions **Requirements** (cont.)	Original owner of old Truck B and new owner of retrofit Truck A shall: • Scrap Truck B. • On Truck A, commit to at least 4 years of 100% California-only operation and California base-plated registration. Dual plates, IRP, and any other out-of-state registrations are prohibited. • On Truck A, commit to at least 50% of travel in trade corridors for duration of contract term. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain filter in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty on filter. • Certify that there are no outstanding ARB equipment violations associated with any of the trucks involved in the equipment project.
Project Cost Assumptions	• Option (1): Total cost of a diesel particulate filter is ~$10,000. • Option (2): Total average cost of a repower project is ~$40,000. • Options (3) & (4): Total cost of a new MY2007 truck is ~$100,000 (diesel) to ~$180,000 (natural gas).

C. Locomotives

Equipment Project Specifications

~~Locomotives and Railyards~~	
Eligible Equipment	Diesel-powered freight locomotives with no or minimal emissions control technology (i.e., uncontrolled, or meeting Tier 0 or Tier 1 standards). Equipment owner must demonstrate: • Operation of locomotive or equivalent locomotive horsepower in California for the past 2 years. • At least 50% operation of locomotive or equivalent locomotive horsepower within trade corridor(s) for the past 2 years. • Estimated diesel fuel usage greater than 20,000 gallons per year.
Option (1): Switcher Locomotive	Partial funding for the lower of 50% or $750,000 per locomotive to replace, rebuild, or repower an uncontrolled, Tier 0 or Tier 1 switcher locomotive with a new generator-set that achieves emissions of 3.5g/bhp-hr or less for NOx, and 0.14 g/bhp-hr or less for PM, or an ~~alterative~~alternative technology with equivalent emission levels using U.S. EPA engine certification test results with ARB verification. Eligible locomotive costs include a new chassis, a new or rebuilt engine, and mechanical/electrical systems components necessary for safe operation.
Requirements	Equipment owner shall: • Commit to 15 years of 100% operation within the trade corridors; periodic out-of-state maintenance may be permitted if outlined in the contract between the local agency and equipment owner. • Scrap or ban old engine/locomotive from California operation. • Install an active GPS unit on both old (if not scrapped) and new equipment, fund data collection, and report location data. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and comprehensive insurance on upgraded equipment. • (For UP and BNSF) Demonstrate how the railroad intends to comply with the 1998 agreement for the South Coast Air Basin by submitting a compliance plan to ARB prior to application for bond funding in the Los Angeles/Inland Empire corridor.

Locomotives and Railyards (cont.)

Option (2): Line-Haul Locomotive	Partial funding for the lower of 50% or $1 million/locomotive to replace or rebuild an uncontrolled, Tier 0 or Tier 1 line-haul locomotive with a new Tier 2 or lower-emission engine. Eligible locomotive costs include a new chassis, a new or rebuilt engine, and mechanical/electrical systems components necessary for safe operation.
Requirements	Equipment owner shall: • Commit to 15 years of 100% California-only operation. This new intrastate line-haul locomotive shall use California ARB diesel fuel. Periodic out-of-state maintenance may be permitted if outlined in the contract between the local agency and equipment owner. • Commit to at least 50% of operation in trade corridors for duration of contract term. • Scrap or ban old engine/locomotive from California operation. • Install an active GPS unit on both old (if not scrapped) and new equipment, fund data collection, and report location data. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and comprehensive insurance on upgraded equipment. • (For UP and BNSF) Demonstrate how the railroad intends to comply with the 1998 agreement for the South Coast Air Basin by submitting a compliance plan to ARB prior to application for bond funding in the Los Angeles/Inland Empire corridor.
Project Cost Assumptions	• Estimated total cost of new switcher generator-set is ~$1.5 million. • Estimated total cost of an eligible Tier 2 locomotive is ~$2.0-$2.5 million.
Excluded Funding Components	• Auto start/stop devices required by regulation or agreements. • GPS units and monitoring and reporting costs.

D. Shore Power

Equipment Project Specifications

~~Shore Power~~	
Eligible Equipment	Existing cargo ship berth or existing cargo ship terminal at a seaport located in a trade corridor.
Option (1) Grid-Based Power	The lower of $2.5 million/berth or 50% of the covered shore-side costs of installing permanent, grid-based electrical power at a cargo ship berth.

Requirements	• Program-funded grid-based shore power shall be installed and in operation at least 2 years prior to a regulatory requirement for that technology or level of emissions control.
	
	Equipment owner shall:
	• Commit to at least 20 years of the use of grid-based shore power at the berth at the following levels or greater:
	  ○ 25% of ship visits in 2011-2013.
	  ○ 60% of the ship visits in 2014-2016.
	  ○ 70% of the ship visits in 2017-2019.
	  ○ 90% of the ship visits in 2020 and beyond.
	• Agree to equipment inspections that include demonstrated operability with a cargo ship fully powered by shore-based electrical power.
	• Comply with record-keeping, reporting, and audit requirements.
	• Sign a legally binding contract with the local agency including project milestone and completion deadlines.
	• Comply with all permitting requirements.

Shore Power (cont.)

Option (2) Non-Grid-Based Power	Partial funding of up to $200,000 per megawatt of the covered costs of an electricity generating unit that provides power at a cargo ship berth or multiple berths. This unit can be portable or fixed on the terminal. Only zero emission units (e.g., fuel cell, solar), or natural gas engines equipped with selective catalytic reduction to control NOx emissions are eligible.

Requirements	• Program-funded non-grid-based shore power shall be installed and in operation by January 1, 2010.
	
	Equipment owner shall:
	• Commit to 7 years of 100% California operation at the following levels or greater:
	  ○ 1,000 hours per year in 2010-2011.
	  ○ 2,000 hours per year in 2012-2013.
	  ○ 3,000 hours per year in 2014 and beyond.
	• Agree to equipment inspections that include demonstrated operability with a cargo ship fully powered by shore-based electrical power supplied by the electricity generating unit.
	• Comply with record-keeping, reporting, and audit requirements.
	• Sign a legally binding contract with the local agency including project milestone and completion deadlines.
	• Properly maintain equipment in good operating condition and according to manufacturer's recommendations.
	• Demonstrate proof of equipment warranty.
	• Comply with all local permitting requirements.
	• Perform source testing to measure emissions from the unit every 1,000 hours of operation, according to the source test requirements contained in ARB's shore power regulation.

Pro-rated Alternative	Equipment owners may opt for a pro-rated alternative consisting of duplicate requirements, except that the Program will pay up to $140,000 per megawatt for a 5 year commitment to use non-grid-based shore power in 100% California operation.
Project Cost Assumptions	• Total shoreside cost of equipping a berth with permanent grid-based electrical power is ~$5.0 million/berth; some ports may incur additional costs to bring new/additional power capacity to the port. • Total cost of distributed generation power is anticipated to be $4.0 million/2 MW unit. • Shipside modifications will cost ~$1 million/ship.
Excluded Funding Components	• Providing additional electrical power to the port. • Construction and protection of infrastructure (e.g., natural gas lines) used to supply fuel for non-grid-based electrical generation. • Shipside modifications to accept shore-based electrical power.

E. Commercial Harbor Craft

Equipment Project Specifications

~~Commercial Harbor Craft~~	
Eligible Equipment	Existing commercial diesel harbor craft vessels involved in freight movement operations with: a home port located in a trade corridor, 2 years of operation in California waters, and uncontrolled (Tier 0) diesel propulsion engine(s). Eligible vessel types include: • Tugboats and towboats. • Work, pilot, crew, and supply boats. • Commercial fishing boats with at least 700 operational hours per year.
Option (1) Replacement/ Repower of Tugs/Tows	For repowers on tugs and tows, the lower of 50% of total cost or $135/horsepower of the old engine to replace a Tier 0 propulsion engine with a new model engine meeting latest emission standards (Tier 2 or lower emissions) and make necessary vessel modifications to accommodate the new engine. For replacements of tugs and tows, the lower of 50% of total cost or $135/horsepower of the engine in the old vessel to replace a vessel with a Tier 0 propulsion engine with a new vessel powered by an engine meeting latest emission standards (Tier 2 or lower emissions).
Requirements	• Program-funded engine repowers and replacements for tugboats and towboats shall be in operation at least 2 years prior to a regulatory requirement for that technology or level of emissions control. Equipment owner shall: • Commit to 15 years of California home port operation in the trade corridors. • Scrap old engine or vessel (as applicable). • Agree to accept an electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Demonstrate proof of comprehensive insurance on upgraded equipment. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Certify that there are no outstanding ARB equipment violations associated with the equipment project application.
Pro-rated Alternative	Equipment owner may opt for a pro-rated alternative consisting of duplicate requirements, except that the Program will pay up to half of the Program funding level described above for a 7 year commitment of California home port operation in the trade corridors.

Commercial Harbor Craft (cont.)

Option (2) Replacement/ Repower of Other Vessels	Other vessel types may include: work, pilot, crew, or supply boats involved in freight movement operations; and high use commercial fishing vessels. For repowers of other vessels, the lower of 80% or $215/horsepower of the old engine to replace a Tier 0 propulsion engine with a new model meeting latest emission standards (Tier 2 or better) and make necessary vessel modifications to accommodate the new engine. For replacements of other vessels, the lower of 80% or $215/horsepower of the engine in the old vessel to replace a vessel with a Tier 0 propulsion engine with a new vessel powered by an engine meeting latest emission standards (Tier 2 or lower emissions).
Requirements	Equipment owner shall: • Commit to 10 years of 100% California home port operation in trade corridors. • Scrap old engine or vessel (as applicable). • Agree to accept an electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Demonstrate proof of comprehensive insurance on upgraded equipment. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. Certify that there are no outstanding ARB equipment violations associated with the equipment project application.
Pro-rated Alternative	Equipment owner may opt for a pro-rated alternative consisting of duplicate requirements, except that the Program will pay up to half of the Program funding level described above for a 5 year commitment of California home port operation in the trade corridors.
Project Cost Assumptions	• Total cost of a Tier 2 engine is estimated at $270/horsepower.
Excluded Funding Components	• Out of service time (dry dock) costs.

F. Cargo Handling Equipment

Equipment Project Specifications

~~Cargo Handling Equipment~~	
Eligible Equipment	Existing diesel-powered rubber-tired gantry crane with a Tier 4 engine or Level 3 verified diesel emission control device operating at a seaport or intermodal railyard in a trade corridor. To meet this eligibility requirement, equipment owners may propose to upgrade existing cranes concurrent with the installation of a Program-funded energy storage system. No Program funds shall be used to upgrade existing cranes to meet the eligibility requirements under this Program.
Option (1) Energy Storage System	The lower of 50% of the total project cost or $160,000 per crane for purchase and retrofit of an energy storage system that ARB has verified to Level 1 (25% PM control) or higher.
Requirements	Equipment owner shall: • Commit to 15 years of 100% California operation in port or intermodal railyard service in trade corridors. • Agree to accept an on-board electronic monitoring unit at any time during the contract term. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty and comprehensive insurance on upgraded equipment. • Comply with all local permitting requirements. • Not use the energy storage system to comply with ARB's rule for diesel cargo handling equipment. • Certify that there are no outstanding ARB equipment violations associated with the equipment project application. • Demonstrate proof that the existing crane was upgraded to meet Program eligibility requirements if the improvements were done concurrent with the installation of a Program-funded energy storage system.
Pro-rated Alternative	Equipment owners may opt for a pro-rated alternative consisting of duplicate requirements, except that the Program will pay the lower of 25% or $80,000 for a 10 year commitment of 100% California-only operation in port or intermodal railyard service in trade corridors.
Project Cost Assumptions	• Total cost of energy storage unit is ~$160,000-$320,000 per crane.

G. Truck Stop/Distribution Center Electrification

Equipment Project Specifications

~~Truck Stop/Distribution Center Electrification~~

Eligible Equipment	Truck stops, intermodal facilities, distribution centers, and other places where Class 8 heavy diesel trucks (over 33,000 lbs) congregate in a trade corridor.
Option (1) Electrification Infrastructure	Landside electrification infrastructure to reduce diesel engine idling and use of diesel-fueled internal combustion auxiliary power systems may be funded at the lower of 50% of eligible costs or a level commensurate with the weighted reductions per State dollar invested for truck replacement projects. Eligible costs include purchase and installation of electrical infrastructure to: enable heating, cooling, and the use of cab power for parked trucks at truck stops; and enable the use of power for transport refrigeration units and auxiliary power systems at distribution centers, intermodal facilities, and other places where trucks congregate. Reimbursement for the eligible costs shall be based on demonstrated use over the first year of operation.
Requirements	Equipment owner shall: • Commit to 10 years of operation. • Agree to equipment inspections. • Comply with record-keeping, reporting, and audit requirements. • Sign a legally binding contract with the local agency including project milestone and completion deadlines. • Properly maintain upgraded equipment in good operating condition and according to manufacturer's recommendations. • Demonstrate proof of equipment warranty. • Comply with all local permitting requirements.
Project Cost Assumptions	• Total cost for distribution centers is $1,500-$7,000/plug at dock; $2,500-$9,000/plug in parking areas; $500-$2,000/adapter for trailers and TRUs. • Total cost for truck stops is $6,000-$18,000/parking space; $3,000/truck modification.
Excluded Funding Components	• On-board auxiliary power units and other equipment installed on trucks are not eligible for funding. Transport refrigeration units are not eligible for funding. Electricity costs are not reimbursable.

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APPENDIX I

Truck Projects from FY2008-09 (Year 2) and Later Funds – Maintaining Eligibility for Inoperable, Destroyed, or Stolen Equipment

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Truck Projects from FY2008-09 (Year 2) and Later Funds – Maintaining Eligibility for Inoperable, Destroyed, or Stolen Equipment

The local agency may allow an equipment project to remain eligible for Program funds if the existing equipment is accidentally rendered inoperable, destroyed, or stolen prior to replacement. The equipment owner must promptly notify the local agency and take action using an appropriate remedy, as described below.

Table I.1 Requirements for Maintaining Eligibility for Inoperable, Destroyed or Stolen Equipment *(entire table is included as new text)*

Timing	Type of Inoperable Equipment
Case 1: Equipment owner has submitted application, but local agency has **not** closed solicitation period.	**Inoperable, Destroyed, or Stolen Truck** • Equipment owner repairs the truck and/or engine at the owner's expense; or • Equipment owner withdraws the original application and submits a new application for a different truck.
Case 2: Solicitation period has closed, but local agency has **not** posted ranked list on website.	**Inoperable Truck** Equipment owner repairs the truck and/or engine at the owner's expense. **Destroyed Truck** • Local agency verifies that the vehicle identification number (VIN) of the destroyed truck matches application. • Equipment owner provides local agency with documentation that truck was operational up until the event of destruction. • Equipment owner replaces destroyed truck with a substitute truck that meets Program Guidelines, as confirmed by local agency inspection. • Local agency updates application information with substitute truck data and uses updated project data for ranking. • The project follows typical Program procedures. **Stolen Truck** The equipment project is no longer eligible for Program funding.

Table I.1 Requirements for Maintaining Eligibility for Inoperable, Destroyed or Stolen Equipment (cont.)

Timing	Type of Inoperable Equipment
Case 3: Local agency has posted ranked list on website but has **not** completed pre-inspection.	**Inoperable Truck** Equipment owner repairs the truck and/or engine at the owner's expense. **Destroyed Truck- Alternative Pre-Inspection** • Local agency verifies that the VIN of the destroyed truck is legible and matches application. • Equipment owner provides local agency with documentation that truck was operational up until the event of destruction. • Equipment owner replaces the destroyed truck with a substitute truck that meets Program Guidelines, as confirmed by local agency inspection. This substitute truck is scrapped prior to taking possession of the Program-funded replacement truck. • The original truck cannot be brought back into service and the equipment owner provides the local agency with DMV documentation of dismantling or non-repairable status (DMV REG 42 "Notice to Dismantler" or REG 488C "Non-Repairable Vehicle Certificate"). **Stolen Truck** The equipment project is no longer eligible for Program funding.

Table I.1 Requirements for Maintaining Eligibility for Inoperable, Destroyed or Stolen Equipment (cont.)

Timing	Type of Inoperable Equipment
Case 4: Local agency has posted ranked list on website and completed pre-inspection.	**Inoperable Truck** • Equipment owner repairs the truck and/or engine at the owner's expense or replaces the inoperable truck with a substitute truck that meets Program Guidelines, as confirmed by local agency inspection. This substitute truck is scrapped prior to taking possession of the Program-funded replacement truck. • The original truck cannot be brought back into service and the equipment owner must provide the local agency with DMV documentation of dismantling or non-repairable status (REG 42 or 488C). **Destroyed Truck** • Equipment owner replaces the destroyed truck with a substitute truck that meets Program Guidelines, as confirmed by local agency inspection. This substitute truck is to be scrapped prior to taking possession of the Program -funded replacement truck. • The original truck cannot be brought back into service and the equipment owner must provide the local agency with DMV documentation of dismantling or non-repairable status (REG 42 or 488C). **Stolen Truck** • Local agency verifies independent documentation of theft (e.g., police report, insurance claim), and that the documented VIN of the stolen truck matches application. • Equipment owner replaces the stolen truck with a substitute truck that meets Program Guidelines, as confirmed by local agency inspection. The substitute truck is to be scrapped prior to taking possession of the Program-funded replacement truck.
Case 5: Local agency has posted ranked list on website, completed pre-inspection, and has scheduled but not completed post-inspection.	**Inoperable, Destroyed, or Stolen Truck** • Equipment owner provides local agency with documentation that the truck was in operation up to the time that post-inspection was scheduled. • Local agency verifies independent documentation of incident and that the documented VIN of the truck matches application • The inoperable or destroyed truck is scrapped prior to taking possession of the Program-funded replacement truck.

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APPENDIX ~~H~~J

Early Grants from FY2007-08 (Year 1) Funds

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Early Grants from FY2007-08 (Year 1) Funds

SB 88 made available no more than $25 million of the FY2007-08 (Year 1) appropriation available for the purpose of executing grant agreements directly with ports, railroads, or local air districts for eligible projects to achieve the earliest possible health risk reduction. SB 88 required that ARB allocate funds under this "early grant" provision consistent with these Guidelines, and that ARB provide sufficient opportunity for the public to review and comment on any projects proposed for funding.

In order to bring early grant proposals to the Board as quickly as possible, ARB staff directly contacted local air districts within the trade corridors to request proposals for local agency projects that could be under contract with equipment owners and mostly complete by July 31, 2008. ARB staff focused on local air districts due to their demonstrated experience and expertise implementing incentive programs through the Carl Moyer ~~incentive~~ program.

To ensure that the early grant project proposals would be consistent with the eligibility and equipment project requirements included in the Guidelines, ARB staff advised the local air districts to use the *Staff Draft Concepts for Implementation* document, released September 19, 2007, as the primary basis for equipment project requirements under the early grant provision. In early November 2007, ARB staff also provided the local air districts with *ARB Staff Expectations for Early Grant Proposals* (attached) to further specify the content of the early grant proposals as well as other critical information (e.g., per equipment funding levels) pertinent to the air district's development of an early grant proposal.

On November 20, 2007, ARB staff held a conference call with air districts interested in submitting an early grant proposal to clarify questions. In response to comments from the air districts regarding the potential for harbor craft projects that could be quickly implemented, ARB staff expanded the early grant eligibility requirements to allow harbor craft projects at $135 per horsepower.

ARB requested that the proposals include only the information necessary for ARB staff to subsequently calculate the proposal benefits using methods, calculations, and emission factors consistent with those included in the Guidelines.

ARB staff received five early grant proposals, posted on the Program website at: http://www.arb.ca.gov/gmbond.

ARB staff recommendations for early grant funding include truck projects and one grid-based shore power proposal. Most of the truck proposals submitted by the air districts are based on actual equipment project applications that the air districts received through other incentive programs (like the Carl Moyer program) or direct solicitations based on air district staff assumptions about what this Program would require, as described in the

air district early grant applications. Due to the expedited nature and intent of the early grant proposals, these applications may be considered for funding under this Program.

In order to maintain consistency between the early grants and the other provisions of these Guidelines, the following sections of these Guidelines are applicable to the early grant equipment projects:

- Chapter II, Section E.10
- Chapter III
  - Section B.1
  - Section E.9
- Chapter IV
  - Sections A.1, 3, 5-8, 10-14, and 16-18
  - Sections B, D, and E
- Chapter VI
- Appendix F

These sections apply to the early grant projects to ensure that the equipment projects considered for funding by each air district are consistent with these Guidelines. In particular, although the projects may have been initially identified through a solicitation process or identified from an existing incentive program, the air district must still verify the equipment projects' eligibility for Program funds and competitively rank them against each other to ensure that the projects with the greatest benefits are funded first.

In addition, since the air districts did not have the benefit of the detailed provisions in the draft Guidelines while identifying equipment projects for their early grant applications, the equipment project provisions in Appendices A-HG apply except where ARB staff provided equipment specifications that differ in the *ARB Staff Expectations for Early Grant Proposals*. In these cases, the air district may choose which equipment specifications work best for their early grant projects.

For example, for grid-based shore power projects under the early grants, ARB staff set the Program funding limit at the lower of $2.5 million or 70 percent. In response, the Bay Area Air Quality Management District (BAAQMD) proposed a grid-based shore power project in Oakland that is requesting $1.4 million per berth for two berths ($2.8 million total Program funds) for a project with a total cost of $4 million. Although these Guidelines currently propose a per berth funding cap in these Guidelines of $2.5 million, or 50 percent, whichever is lower, ARB's early grant recommendation for BAAQMD's grid-based shore power project maintains the funding caps originally offered.

In another example, for trucks, *ARB Staff Expectations for Early Grant Proposals* set the operational commitment at 5 years for truck retrofits and 10 years for truck replacements. Since the current Guidelines are less restrictive, air districts may allow equipment projects to sign equipment contracts with commitments set according to these Guidelines instead of the original concepts.

Goods Movement Emission Reduction Program
FY2007/2008 (Year 1)

ARB Staff Expectations for Early Grant Proposals

This document includes ARB staff's expectations for FY2007-08 (Year 1) Early Grant Proposals submitted by local air district applicants. We have also included specific information that supplements and/or modifies the eligibility and operational requirements described in the September 19, 2007 concept paper for the early grant proposals.

In general, ARB staff expects the early grant proposals to follow the staff draft concept paper. We have listed several key expectations for emphasis and clarification.

- The early grant proposals represent a commitment by the applicant to sign a grant agreement with ARB if the Board approves the full or partial proposal, as submitted. We understand that the applicant may reserve the right to withdrawal the proposal should the Board change the conditions or eligibility requirements of the early grants. To provide the Board maximum flexibility in allocating the full $25 million in early grant dollars, **we request that you design the proposals to allow pro-rated funding and acknowledge your willingness to accept a lower funding amount.**
- Local agency and equipment eligibility requirements remain as stated in the September 19, 2007 staff draft concept paper, with the exception of the modifications included in this document.
- Equipment operational requirements remain as stated in the September 19, 2007 staff draft concept paper, with the exception of the modifications included in this document.
- Pre/post equipment inspections will be conducted to ensure both the old (as applicable) and new equipment are eligible and operational.
- Legally binding contracts will be signed between the implementing local agency and equipment owners to ensure program accountability.
- Implementing local agencies and equipment owners agree to the reporting and record keeping requirements of the bond program.
- Implementing local agencies will monitor bond-funded equipment for compliance with contract provisions.

The following outline provides the content requirements for the early grant proposals. As indicated, we request that the submittals be no more than 10 pages in length, and preferably shorter. We intend to append these proposals to our proposed Guidelines for public review and comment prior to Board consideration.

- Summary of proposal (1-2 pages).
  - Briefly state the air quality and health concerns addressed.
  - Summarize project types, corridor(s), and costs.
  - Identify the implementation schedule (with major milestones).
    - What/how much can you accomplish by June 30, 2008?
    - Why these accomplishments are achievable.

- Detailed proposal (5-10 pages).
  - Geographic coverage
    - Identify the targeted trade corridor(s).
    - Does the proposal target equipment upgrades in specific highly impacted communities? If so, which ones?
    - Describe marketing/outreach (must include entire corridor).
  - Old equipment
    - Certify that old equipment eligibility is based on the equipment project information tables in the staff draft concept paper, as modified by this document.
    - Identify the number of pieces of equipment targeted, by sector.
      - Describe the basis for proposing this number of equipment for expedited implementation under the early grants.
      - For trucks, identify the number of retrofits and the number of replacements being proposed.
    - Operating assumptions for old equipment.
      - Trucks (list retrofits and replacements separately).
        - Average age (model year).
        - Average annual vehicle miles traveled.
      - Locomotives (only switchers).
        - Average age (years).
        - Control level (uncontrolled, Tier 0, Tier 1).
        - Average annual fuel use.
        - Average annual operating hours.
      - Shore power.
        - Identify type(s) of cargo vessel (container, bulk, reefer).
  - New equipment
    - Certify that old equipment eligibility is based on the equipment project information tables in the staff draft concept paper, as modified by this document.
    - Operating assumptions for new equipment.
      - Trucks.
        - Must be model year 2007 or 2008 truck.
        - Average annual vehicle miles traveled (if different from old equipment).
        - Identify fuel type.
      - Locomotives (switchers only).
        - Identify fuel type.
        - ARB staff shall use annual operating hours reported for old equipment to calculate emission benefits.
      - Shore power.
        - Ship visits per year using shore power (per berth).

(ARB staff shall use operating assumptions to do the calculations consistent with factors/ formulas/methodologies that will be included in the draft Guidelines.)

- Staff resources.
  - Describe staff resources available to implement proposal.
- Funding proposals. (Note: Please separate by sector. ARB will consider each sector as a separate proposal.)
  - Total cost.
    - Identify truck costs for retrofits and replacements.
  - Bond funds requested.
  - Matching funds.
    - Detail funding source.
      - Demonstrate that these funds are available.
      - DMV $4 and $2 fees may be used as non-state match *(since clarified to be $4 fees only).*
  - Administration funds requested.
    - Must comply with staff concept limits.
- Early grant milestone requirements.
  - 100 percent of contracts signed with equipment owners by June 30, 2008.
  - Trucks.
    - Majority of proposed truck upgrades completed and operational by June 30, 2008.
    - All of proposed truck upgrades completed and operational by December 31, 2008.
  - Locomotives.
    - All of new locomotives ordered by June 30, 2008.
    - All of new locomotives operational by December 31, 2009.
  - Shore power.
    - All completed and operational by December 31, 2010.
- Provide a project schedule that includes interim milestones.
  - Outline specific accomplishments by June 30, 2008.
- Implementation.
  - Describe how you will secure equipment projects.
  - Describe how you will select projects for funding.

Table J-1. Goods Movement Emission Reduction Program Early Grant Proposals – Updated Requirements *(Updates to project options identified in staff concept paper)*

Category	Eligibility	Amounts	Contract Length	Surplus
Truck retrofits	- at least 50% of operation of old equipment must take place within the four trade corridors	$5,000 per retrofit	5 years	6 months
Truck replacement	- at least 50% of operation of old equipment must take place within the four trade corridors - old truck must have annual VMT of 10,000 miles or greater	$50,000 per truck	10 years	3 years
Shore power	- grid-based power only	$2.5M/berth (grid-based), or 70% of the shoreside cost to bring power to berth, whichever is less	20 years	3 years
Locomotives	- switchers only - at least 50% of operation of old equipment must take place within the four trade corridors - uncontrolled locomotives eligible with 35,000 gal/yr minimum	$500,000/switcher (no DPF required)	20 years	N/A
Harbor craft	Not eligible for early grants			

Note: Early grants must maintain requirement for 100 percent California operation for new equipment (except for periodic locomotive maintenance).

APPENDIX ~~G~~K

~~Trade Corridor~~ Maps

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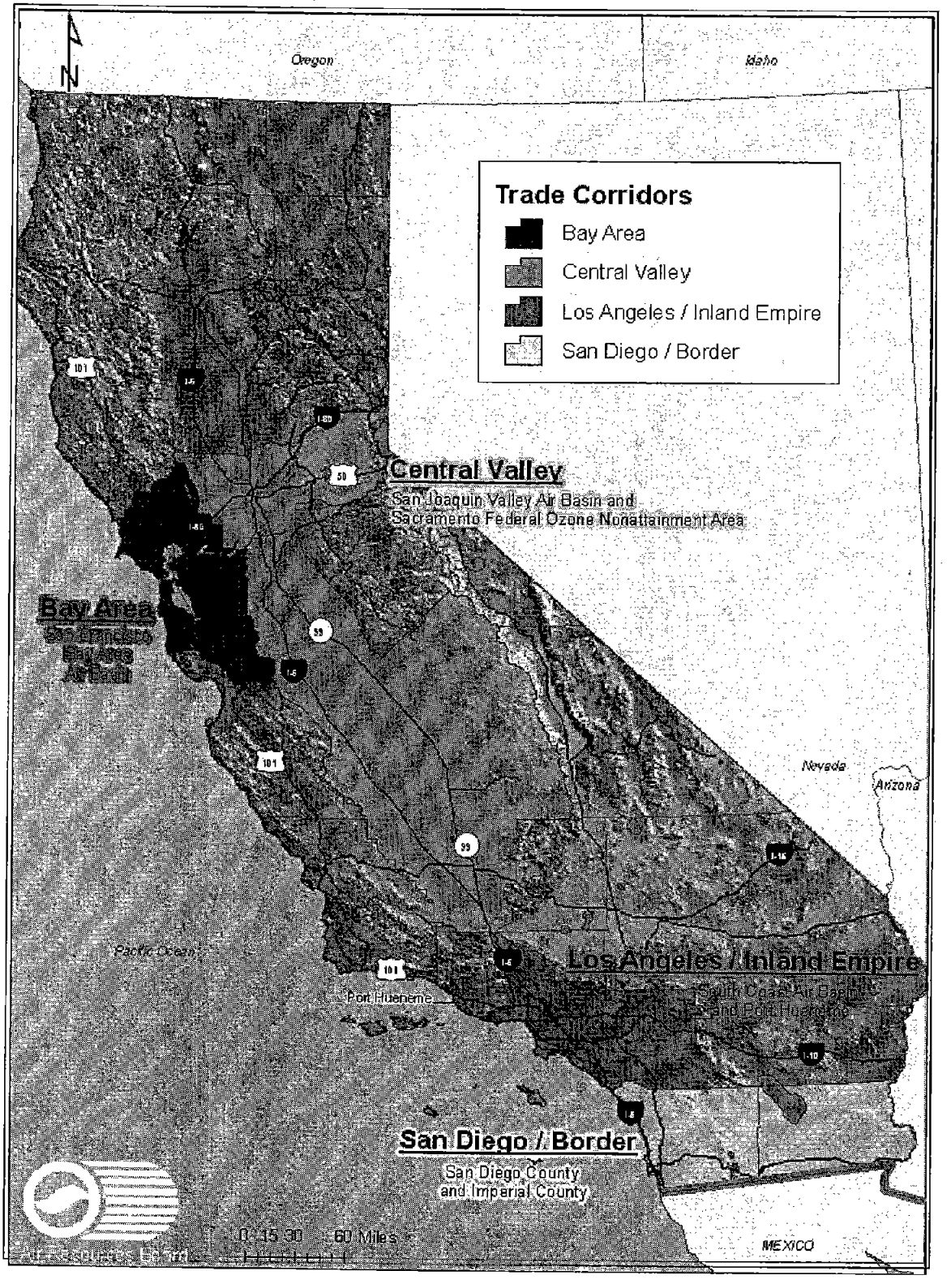
Oregon
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Trade Corridors
Bay Area
Central Valley
Los Angeles / Inland Empire
San Diego / Border
Central Valley
San Joaquin Valley Air Basin and
Sacramento Federal Ozone Nonattainment Area
Bay Area
San Francisco
Bay Area
Air Basin
Nevada
Arizona
Pacific Ocean
Los Angeles / Inland Empire
South Coast Air Basin
and Port Hueneme
Port Hueneme
San Diego / Border
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and Imperial County
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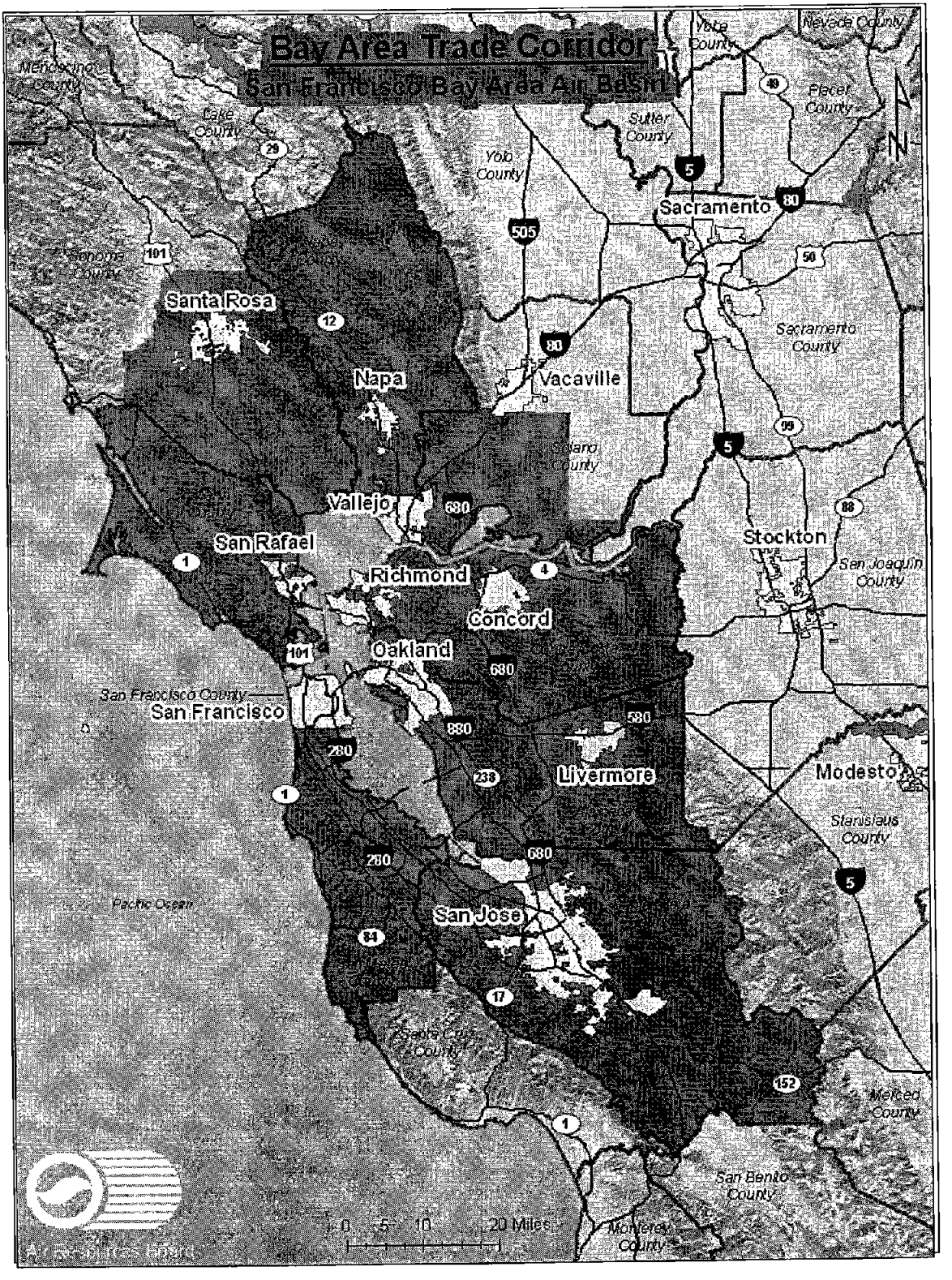
MEXICO


Bay Area Trade Corridor
San Francisco Bay Area Air Basin
Mendocino County
Lake County
Sonoma County
Yolo County
Solano County
Sutter County
Yuba County
Nevada County
Placer County
Sacramento County
San Joaquin County
Stanislaus County
Merced County
San Benito County
Monterey County
Santa Cruz County
San Francisco County
Pacific Ocean
Santa Rosa
Napa
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Stockton
Modesto
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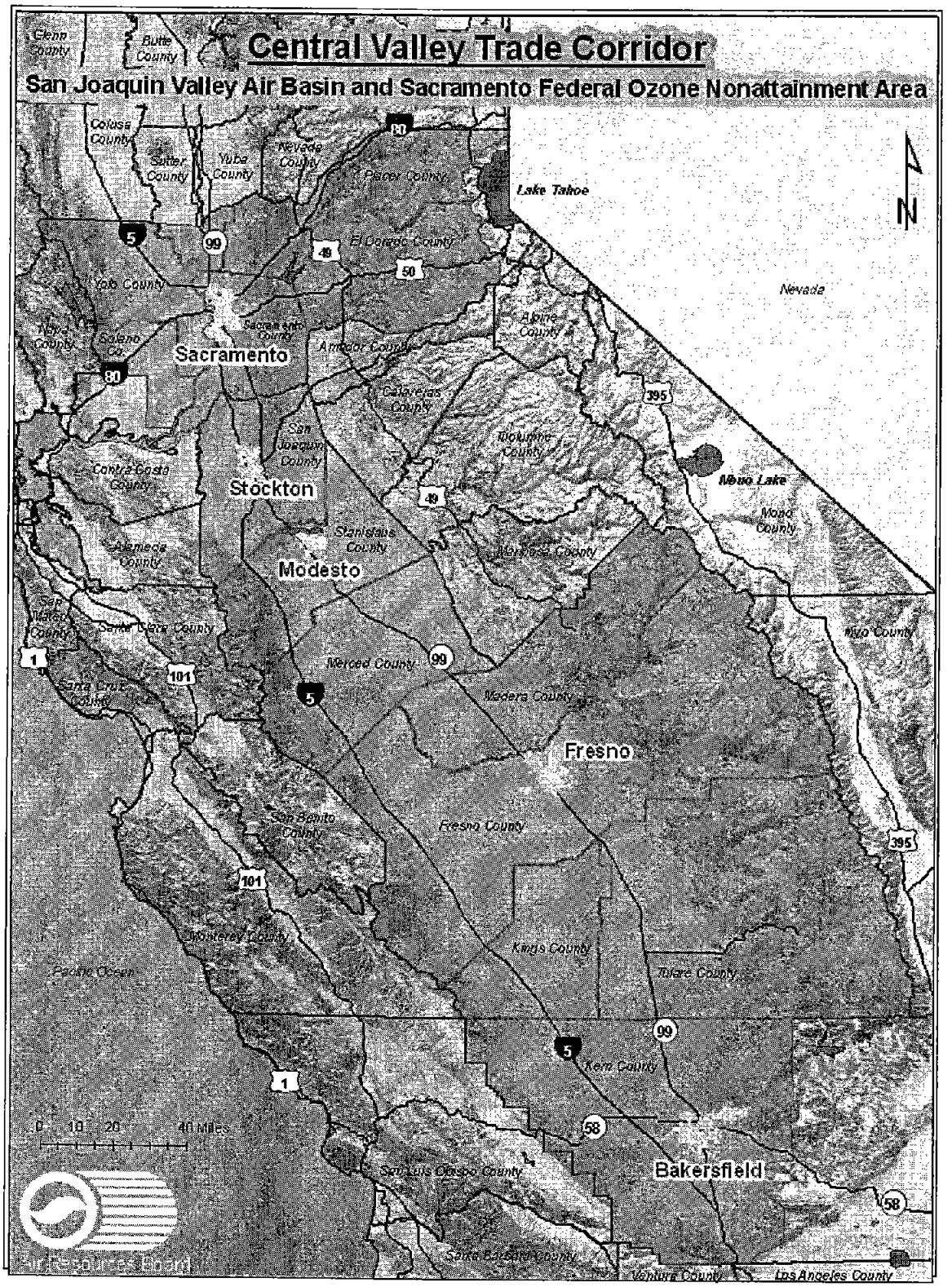
Central Valley Trade Corridor
San Joaquin Valley Air Basin and Sacramento Federal Ozone Nonattainment Area
Glenn County
Butte County
Colusa County
Sutter County
Yuba County
Nevada County
Placer County
Lake Tahoe
El Dorado County
Yolo County
Solano Co.
Sacramento
Amador County
Alpine County
Nevada
Calaveras County
Tuolumne County
San Joaquin County
Stockton
Contra Costa County
Mono Lake
Mono County
Stanislaus County
Alameda County
Modesto
Merced County
Madera County
Fresno
Santa Clara County
Santa Cruz County
San Benito County
Fresno County
Monterey County
Kings County
Tulare County
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San Luis Obispo County
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Santa Barbara County
Ventura County
Los Angeles County
Inyo County
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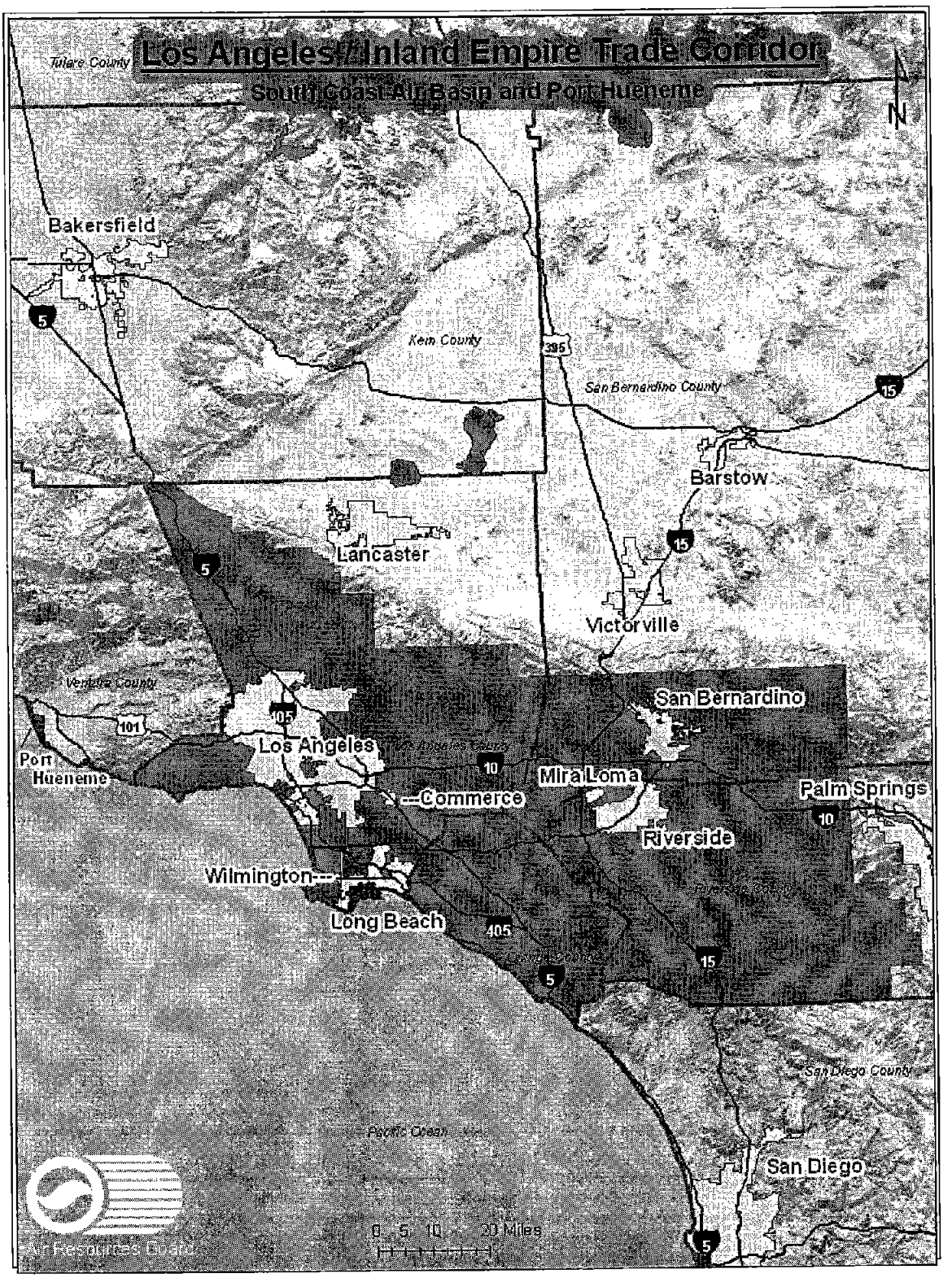
Los Angeles/Inland Empire Trade Corridor
South Coast Air Basin and Port Hueneme
N
Tulare County
Bakersfield
Kern County
San Bernardino County
Barstow
Lancaster
Victorville
Ventura County
San Bernardino
Los Angeles
Port Hueneme
Mira Loma
Commerce
Palm Springs
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Long Beach
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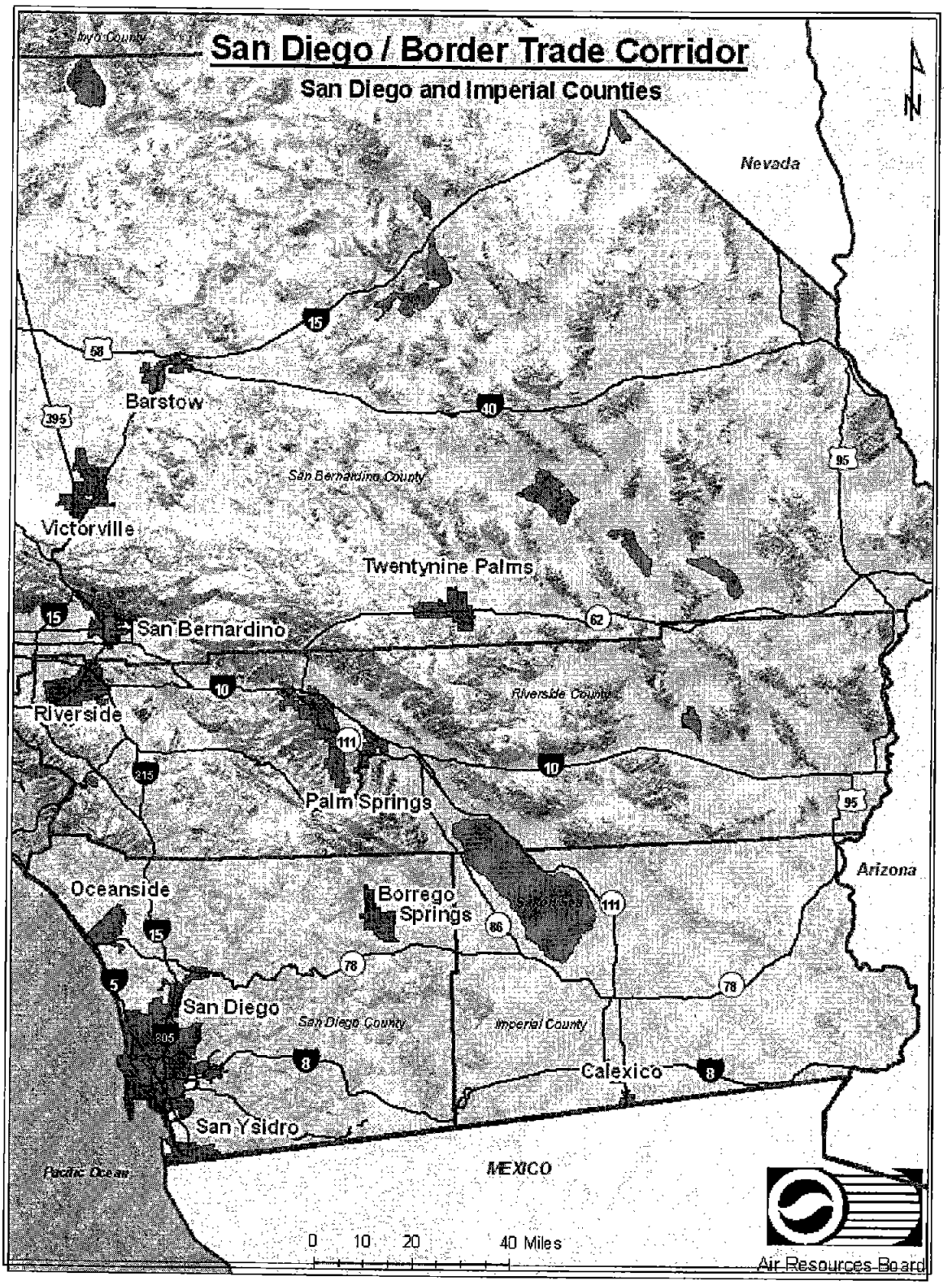
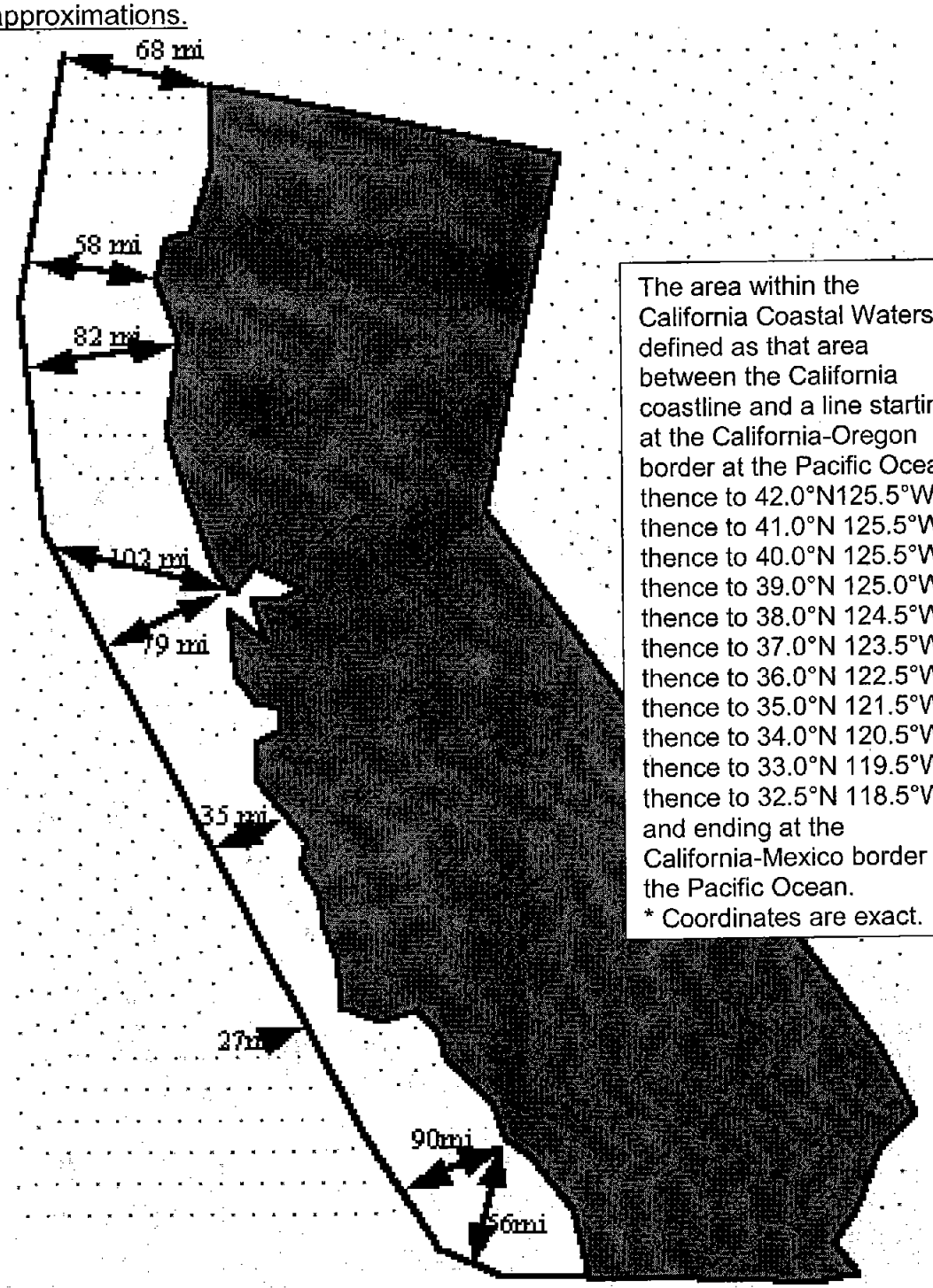

San Diego / Border Trade Corridor
San Diego and Imperial Counties
Inyo County
Nevada
N
15
58
Barstow
395
40
San Bernardino County
95
Victorville
Twentynine Palms
62
15
San Bernardino
10
Riverside County
Riverside
111
10
215
Palm Springs
95
Arizona
Oceanside
Borrego Springs
111
15
86
78
78
5
San Diego
San Diego County
Imperial County
805
8
Calexico
8
San Ysidro
MEXICO
Pacific Ocean
0 10 20 40 Miles
Air Resources Board

California Coastal Waters

The California Coastal Waters boundary ranges from approximately 25 miles off the coast at the narrowest to just over 100 miles at the widest. Distances shown are approximations.



The area within the California Coastal Waters is defined as that area between the California coastline and a line starting at the California-Oregon border at the Pacific Ocean, thence to 42.0°N125.5°W,* thence to 41.0°N 125.5°W, thence to 40.0°N 125.5°W, thence to 39.0°N 125.0°W, thence to 38.0°N 124.5°W, thence to 37.0°N 123.5°W, thence to 36.0°N 122.5°W, thence to 35.0°N 121.5°W, thence to 34.0°N 120.5°W, thence to 33.0°N 119.5°W, thence to 32.5°N 118.5°W, and ending at the California-Mexico border at the Pacific Ocean.
* Coordinates are exact.