

CHAPTER 4

AQMP CONTROL STRATEGY

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INTRODUCTION

The overall control strategy in the AQMP provides a path to achieving emission reductions and air quality goals. Implementation of the 2007 AQMP will be based on a series of control measures and strategies that vary by source type (i.e., stationary or mobile) as well as by the pollutant that is being targeted. Although great strides have been made in air pollution control technologies and emission reduction programs, air quality goals cannot be achieved without significant further emission reductions.

This chapter presents the control measures for the ~~proposed modifications to the~~ Draft Final 2007 AQMP and associated emission reductions, where currently quantifiable. For additional information and details on control measures, please refer to Appendix IV-A: District's Stationary and Mobile Source Control Measures; Appendix IV-B-1 Air Resources Board's Proposed State Strategy for California's 2007 State Implementation Plan; Appendix IV-B-2: District Staff's Proposed Policy Options to Supplement CARB's Control Strategy; and Appendix IV-C: Regional Transportation Strategy and Control Measures. For additional information regarding baseline emission projections and air quality modeling, please refer to AQMP Chapter 3 and Appendix III as well as AQMP Chapter 5 and Appendix V, respectively.

OVERALL ATTAINMENT STRATEGY

The overall control strategy for this draft final Plan is designed to meet applicable federal and state requirements, including attainment of ambient air quality standards. The focus of the Plan is to demonstrate attainment of the federal PM_{2.5} ambient air quality standard by 2015 and the federal 8-hour ozone standard by 2024, while making expeditious progress toward attainment of state standards. The proposed strategy, however, does not attain the previous federal 1-hour ozone standard by 2010 as previously required prior to the recent change in federal regulations.

As demonstrated herein, a “bump-up” request is being made to the U.S. EPA for the South Coast Air Basin to be designated as an “extreme” non-attainment area with a possible extended attainment date of 2024 for ozone as well as for Coachella Valley to be designated as “severe-15” with an extended attainment date of 2018. The Proposed Modifications to the Draft 2007 AQMP relies upon the most recent planning assumptions and the best available information such as CARB's latest EMFAC for the on-road mobile source emissions inventory, CARB's off-road model for the off-road mobile source emission inventory, the latest point source and improved area source inventories as well as the use of new episodes and air quality

modeling analysis, and SCAG's forecast assumptions based on its modified 2004 Regional Transportation Plan.

The proposed control measures in the Proposed Modifications to the Draft 2007 AQMP are based on implementation of all feasible control measures through the application of available technologies and management practices as well as development and implementation of advanced technologies and control methods. These measures rely on proposed actions to be taken by several agencies that currently have the statutory authority to implement such measures. Similar to the 2003 AQMP approach, the SIP commitment is to bring each control measure for regulatory consideration in a specified time frame. Each agency is also committed to achieve a total emission reduction target with the ability to substitute for control measures deemed infeasible, so long as equivalent reductions are met by other means. These measures are also designed to satisfy the federal Clean Air Act requirement of Reasonably Available Control Technologies [Section 172(c)], and the California Clean Air Act requirement of Best Available Retrofit Control Technologies (BARCT) [Health and Safety Code Section 40919, Subsection C].

To ultimately achieve the PM_{2.5} and 8-hour ozone ambient air quality standards and demonstrate attainment, significant additional short- and mid-term as well as long-term emissions reductions will be necessary from sources including those primarily under the jurisdiction of CARB (e.g., on-road motor vehicles, off-road equipment, and consumer products) and U.S. EPA (e.g., aircraft, ships, trains, and pre-empted off-road equipment). Without an adequate and fair-share level of reductions from all sources, the emissions reduction burden would unfairly be shifted to sources that have already been doing their part for clean air. Moreover, the District will continue to use its available regulatory authority to further control mobile source emissions where federal or State action does not meet regional needs.

Designing the Overall Strategy

To develop the ~~Draft~~ Plan's required control strategy for meeting state and federal requirements, an iterative process of technology/strategy review and ambient air quality modeling is utilized. Specifically, a remaining emissions target is initially defined utilizing air quality modeling that will achieve the ambient air quality standards based on reductions from all sources. Control measures based on technological advancements are then evaluated to determine their effectiveness in meeting this remaining emissions target. Further modeling analyses are conducted using the actual emissions reductions achieved based on the technology forecast. Ultimately an overall emissions target (i.e., carrying capacity) is determined that achieves the ambient air quality standards and for which controls have been proposed.

Figure 4-1 illustrates this iterative process used to define the proposed control strategy.

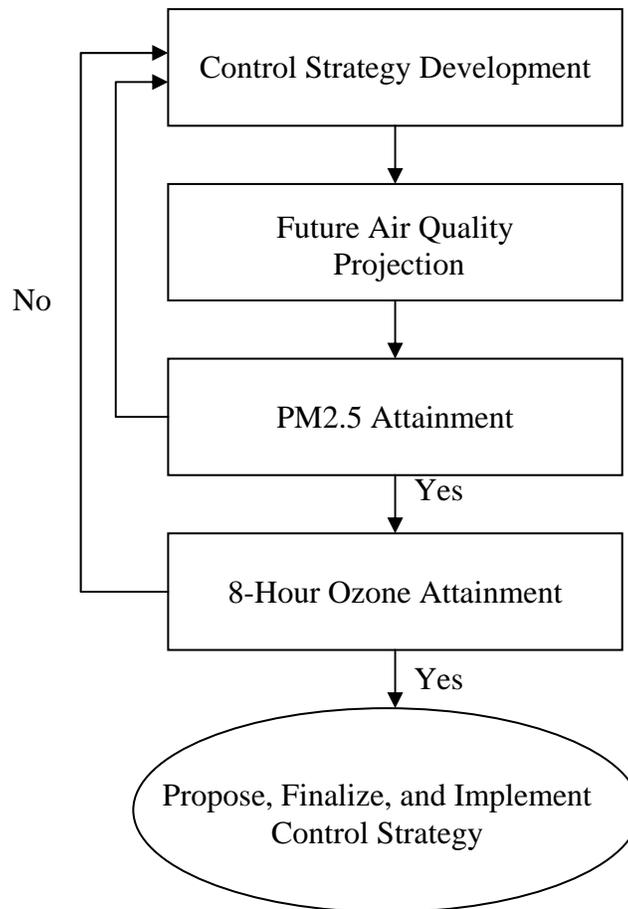


FIGURE 4-1

Iterative Process to Define Emission Reduction Scenario

The ~~proposed modifications to the Draft Final 2007 AQMP~~ relies on a comprehensive and integrated control approach aimed at achieving the PM_{2.5} standard by 2015 first through implementation of short-term and mid-term control measures and achieving the 8-hour ozone standard by 2024 based on implementation of additional long-term measures. The PM_{2.5} control strategy is designed to provide expeditious progress toward the 8-hour ozone attainment in conjunction with additional long-term reductions needed for full attainment. The District's air quality modeling analysis and carrying capacity determination outlined in Chapter 5 and Appendix V provide the basis for designing the attainment strategies. Ammonium nitrates and ammonium sulfates represent a dominant fraction of PM_{2.5} components and are formed in the atmosphere through secondary reactions of precursor emissions of NO_x, SO_x, and ammonia. Based on the District's modeling sensitivity analysis,

SOx reductions, followed by directly-emitted PM2.5 and NOx reductions, provide the greatest benefits in terms of reducing the ambient PM2.5 concentrations. VOC reductions can contribute to improvements in ambient PM2.5 air quality but are of lesser effectiveness yet are critical for making progress toward the 8-hour ozone attainment.

Therefore, the PM2.5 attainment strategy is primarily focused on SOx, directly-emitted PM2.5, and NOx reductions supplemented with additional VOC reductions which can be feasibly achieved by 2014 (the year in which full reductions have to be realized for demonstrating attainment in 2015). SOx and NOx emissions are both products of fuel combustion. Reducing the fuel sulfur content has proven to be one of the most effective strategies for achieving significant SOx reductions and has already been adopted for stationary sources, on-road mobile sources, and the majority of off-road mobile sources except for ocean-going vessels. Therefore, clean fuel strategies based on the use of low-sulfur marine fuel in this single source category will result in significant PM2.5 air quality improvements. In addition, NOx reductions are viable because technologies for implementing NOx control strategies (e.g., add-on control devices, alternative fuels, fleet modernization, repowers, retrofits) are commercially available and are continually undergoing further development. NOx reductions are also critical to attain the 8-hour ozone standard.

The PM2.5 strategy also builds upon on-going diesel toxic reduction programs which not only reduce the toxic impact of diesel emissions but also contribute to PM2.5 air quality benefits. ~~The proposed modifications to the Draft Final AQMP~~ incorporate the emissions benefit associated with these adopted programs as well as the PM2.5 reductions from the short-term and mid-term control measures. VOC emissions also contribute to the formation of secondary particulates (including organic carbon) and enhance ammonium nitrate production. While VOC reductions are less critical to overall reductions in PM2.5 air quality (compared with equivalent SOx, directly-emitted PM2.5, and NOx reductions), they are relied upon for meeting the 8-hour ozone standard. Adequate VOC controls need to be in place in time for achieving the additional VOC reductions needed for the 8-hour ozone standard by 2024. Reducing VOC emissions in early years would also ensure continued progress in reducing the ambient ozone concentrations. The 8-hour ozone control strategy relies on the implementation of the PM2.5 control strategy augmented with additional long-term VOC and NOx reductions for meeting the standard by 2023 timeframe.

Based on the District's modeling analysis, the estimated reduction targets for PM2.5 attainment are approximately ~~192~~ 203 tons per day (t/d) of NOx, 24 t/d of SOx, 14 t/d of PM2.5, and 59 t/d of VOC emissions in 2014, while the reduction targets for the 8-hour ozone attainment are estimated at 116 t/d of VOC and 383 t/d of NOx from the projected inventories in 2023. The PM2.5 attainment strategy is based on the implementation of short-term and mid-term control measures by the District,

CARB, U.S. EPA and SCAG. These measures have defined control methods and specific SIP reduction commitments with adoption dates in the 2007-2010 timeframe with implementation dates from 2008 to 2020. Long-term measures are relied upon for the 8-hour ozone strategy, referring to measures which are based on further development and improvement of known low- and zero-emission control technologies in addition to new technological advancements. Long-term measures have adoption dates in the 2011-2015 timeframe and implementation dates in the 2015 to 2023 timeframe.

The sheer magnitude of emission reductions needed for the attainment of the federal PM_{2.5} and 8-hour ozone standards poses a tremendous challenge to the South Coast Basin. Without an aggressive control strategy and close collaboration of efforts among the federal, state, and regional governments, local agencies, businesses, and the public, the attainment of these standards will not be likely. This chapter outlines the overall proposed control strategy and specific control measures required for achieving these air quality goals in the Basin.

Draft Final 2007 AQMP Control Measures

The Draft 2007 AQMP control measures consist of four components: 1) the District's Stationary and Mobile Source Control Measures; 2) CARB's Proposed Revised Draft State Strategy; 3) District Staff's Proposed Policy Options to Supplement CARB's Control Strategy; and 4) Regional Transportation Strategy and Control Measures provided by SCAG. Overall, the Plan includes 31 stationary and 30 mobile source measures which are defined at this time. A summary of these measures is provided below. A detailed description of each component's control measures is provided in the following appendices:

Appendix IV-A:	District's Stationary and Mobile Source Control Measures
Appendix IV-B-1:	CARB's Proposed State Strategy for California's 2007 State Implementation Plan
Appendix IV-B-2:	District Staff's Proposed Policy Options to Supplement CARB's Control Strategy
Appendix IV-C:	Regional Transportation Strategy and Control Measures

These measures primarily rely on the traditional command-and-control approach, facilitated by market incentive programs, as well as advanced technologies expected to be implemented by 2015 (for PM_{2.5}) and 2024 (for 8-hour ozone).

DISTRICT'S STATIONARY AND MOBILE SOURCE SHORT- AND MID-TERM CONTROL MEASURES

Since the adoption of the 2003 AQMP, the District has made significant strides in achieving further emission reductions from stationary sources. Table 1-2 of Chapter 1 provides a list of rules adopted by the District since adoption of the 2003 AQMP as well as the SIP commitment and the emission reductions achieved for each rule.

For the 2007 AQMP control measure development, District staff conducted an AQMP Summit in June 2006 to solicit new control concepts and innovative ideas. Internal and external brainstorming sessions were also conducted for identifying additional control measures and assessing control feasibility. The stationary source control measures presented in the Draft 2007 AQMP are proposed to further reduce emissions from both point sources (permitted facilities) and area sources (generally small and non-permitted). The basic principles followed in developing the District's stationary source control measures included: 1) identify SO_x and NO_x reduction opportunities and maximize reductions by 2014, and 2) initiate programs or rule making activities for VOC control strategies aiming at maximum reductions by 2023 timeframe. Therefore, the proposed control strategy for stationary sources under the District's jurisdiction include remaining revised and partially implemented measures from the 2003 AQMP and new measures that are deemed feasible to provide additional control opportunity. In addition, to foster further technology advancement, long-term measures are also included aimed at achieving additional reductions from stationary sources based on implementation and accelerated penetration of advanced technologies. For each control measure, the District will seek to achieve the maximum reduction potential that is technically feasible and cost-effective.

Furthermore, in light of significant reductions needed for PM_{2.5} and ozone attainment demonstrations, the District will expand its regulatory programs to mobile sources where the District has existing legal authority, and is evaluating the possibility of additional limited authority for cost-effective local controls. The District is also considering other innovative ideas to mitigate the impact of emissions growth. For example, the District is proposing a back-stop measure to ensure that port-related programs achieve their intended reductions, and a control measure with various approaches for reducing emissions from new and redevelopment residential, industrial and commercial projects.

The District's control strategy for stationary and mobile sources is based on the following approaches: 1) facility modernization; 2) energy efficiency and conservation; 3) good management practices; 4) market incentives/compliance flexibility; 5) area source programs; 6) emission growth management; and 7) mobile

source programs. Table 4-1 provides a listing of District's proposed control measures under each of the seven control approaches.

TABLE 4-1
District's Proposed Control Approaches and Measures

Facility Modernization	
Number	Title
MCS-01	Facility Modernization [NO _x , VOC, PM _{2.5}]
Energy Efficiency/Conservation	
Number	Title
MCS-02	Urban Heat Island [All Pollutants]
MCS-03	Energy Efficiency and Conservation [All Pollutants]
Good Management Practices	
Number	Title
FUG-01	Improved Leak Detection and Repair [VOC]
FUG-02	Emission Reductions from Gasoline Transfer and Dispensing Facilities [VOC]
FUG-04	Emission Reductions from Pipeline and Storage Tank Degassing [VOC]
BCM-01	PM Control Devices (Baghouses , Wet Scrubbers, Electrostatic Precipitators, and Other Devices) [PM _{2.5}]
MCS-04	Emissions Reduction from Green Waste Composting [VOC, PM _{2.5}]
MCS-06	Improved Start-up, Shut-down & Turnaround Procedures [All Pollutants]
Market Incentives/Compliance Flexibility	
Number	Title
CTS-02	Clean Coatings Certification Program [VOC]
CMB-02	Further SO _x Reductions for RECLAIM (BARCT) [SO _x]
FLX-01	Economic Incentive Programs [All Pollutants]
FLX-02	Petroleum Refinery Pilot Program [VOC and PM _{2.5}]
Area Source Programs	
CTS-01	Emission Reductions from Lubricants [VOC]
CTS-03	Consumer Products Certification and Emission Reductions from Use of Consumer Products at Institutional and Commercial Facilities [VOC]

TABLE 4-1 (continued)

District's Proposed Control Approaches and Measures

CTS-04	Emission Reductions from the Reduction of VOC Content of Consumer Products Not Regulated by the State Board [VOC]
FUG-03	Emission Reductions from Cutback Asphalt [VOC]
CMB-01	NOx Reduction from Non-RECLAIM Ovens, Dryers and Furnaces [NOx]
CMB-03	Further NOx Reductions from Space Heaters [NOx]
CMB-04	Natural Gas Fuel Specifications [All Pollutants]
BCM-02	PM Emission Hot Spots – Localized Control Program [PM2.5]
BCM-03	Emission Reductions from Wood Burning Fireplaces and Wood Stoves [PM2.5]
BCM-04	Additional PM Emission Reductions from Rule 444 – Open Burning [PM2.5]
BCM-05	Emission Reductions from Under-Fired Charbroilers [PM]
MCS-05	Emission Reductions from Livestock Waste [VOC]
MCS-07	Application of All Feasible Measures [All Pollutants]
MCS-08	Clean Air Act Emission Charges of \$5,000 Per Ton of VOC Fees for Major Stationary Sources with Potential to Emit Over 10 Tons per Year [VOC, NOx]
Emission Growth Management	
Number	Title
EGM-01	Emission Reductions from New or Redevelopment Projects [NOx, VOC, PM2.5]
EGM-02	Emission Budget and Mitigation for General Conformity Projects [All Pollutants]
EGM-03	Emissions Mitigation at Federally-Permitted Projects [All Pollutants]
Mobile Source Programs	
Number	Title
MOB-01	Mitigation Fee for Federal Sources [All Pollutants]
MOB-02	Expanded Exchange Program [All Pollutants]
MOB-03	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [All Pollutants]
MOB-04	Emissions Reductions from the Carl Moyer Program [NOx, PM2.5]
MOB-05	AB923 Light-Duty Vehicle High-Emitter Identification Program [NOx, VOC]
MOB-06	AB923 Medium-Duty Vehicle High-Emitter Identification Program [NOx, VOC]
MOB-07	Concurrent Reductions from Global Warming Strategies [All Pollutants]

The ~~Proposed Modifications to the Draft Final~~ 2007 AQMP includes 30 short-term and mid-term stationary and 7 mobile source control measures proposed for District implementation. In order to demonstrate attainment by 2015 for PM_{2.5} and 2024 for ozone, emission reductions needed for attainment must be in place by 2014 and 2023. Table 4-2A provides a list of the District's short-term and mid-term control measures in the ~~Proposed Modifications to the Draft Final~~ 2007 AQMP for which the emission reductions are quantified. These measures are estimated to achieve a total of 6.8 tons per day of NO_x, 3 tons per day of SO_x, 10.4 tons per day of VOC, and ~~2.9~~ 4.5 tons per day of PM_{2.5} emission reductions by 2014 and have proposed rule adoption schedules between 2007 and 2010 with implementation dates between 2008 and 2023. The 2023 reductions from these measures are estimated to be 19.3 tons per day of VOC, 9.2 tons per day of NO_x, 3 tons per day of SO_x, and ~~5.4~~ 3.3 tons per day of PM_{2.5} reductions. Table 4-2B presents the District's remaining control measures in the Draft 2007 AQMP which are either not quantified at this time due to data limitations or do not result in direct emission benefits (e.g., Urban Heat Island).

Appendix IV-A provides detailed descriptions for the District's stationary and mobile source control measures. Overall, nine control measures originally contained in the 2003 AQMP have been updated or revised for inclusion in the ~~Proposed Modifications to the Draft Final~~ 2007 AQMP. In addition, twenty eight new measures are incorporated into the ~~Proposed Modifications to the Draft Final~~ 2007 AQMP based on replacement of the District's long-term reduction measures from the 2003 AQMP with more defined control measures or development of new control measures.

TABLE 4-2A

District's Short-Term and Mid-Term Stationary Control Measures
with Quantified Emission Reduction Estimates

Control Measure #	Title	Reduction Target ¹ (tons/day)
<u>Remaining 2003 AQMP Revision Control Measures</u>		
FUG-02	Emission Reductions from Gasoline Transfer and Dispensing Facilities [VOC]	3.7/4.0
BCM-03	Emission Reductions from Wood-Burning Fireplaces and Wood Stoves [PM2.5]	0.7/0.7 <u>1.0/1.6</u>
BCM-05	<u>Emission Reductions from Under-Fired Charbroilers [PM2.5]</u>	<u>1.1/1.2</u>
<u>New Control Measures</u>		
CTS-01	Emission Reductions from Lubricants [VOC]	1.98/2.0
CTS-03	Consumer Products Certification and Emission Reductions from Use of Consumer Products at Institutional and Commercial Facilities [VOC]	2.1/2.2 ²
CTS-04	Emission Reductions from the Reduction of VOC Content of Consumer Products Not Regulated by the State Board [VOC]	5.8/6.0 ²
CMB-01	NOx Reduction from Non-RECLAIM Ovens, Dryers and Furnaces [NOx]	3.5/4.1
CMB-02	Further SOx Reductions for RECLAIM [SOx]	3.0/3.0
CMB-03	Further NOx Reductions from Space Heaters [NOx]	0.8/1.1
MCS-01	Facility Modernization [VOC] [NOx] [PM2.5]	2.0/9.2 1.6/2.2 0.4/1.7
MCS-05	Emission Reductions from Livestock Waste [VOC]	0.8/0.6
FLX-02	Petroleum Refinery Pilot Program [VOC] [PM2.5]	0.7/1.6 0.4/0.4
EGM-01	Emission Reductions from New and Redevelopment Projects [NOx] [VOC] [PM2.5]	0.0/0.8 0.0/0.6 0.0/0.5
MOB-04	Emission Reductions from Carl Moyer Program ³ [NOx] [PM2.5]	7.5/12.9 0.2 /0.4
MOB-05	AB923 Light-Duty Vehicle High-Emitter Identification Program [NOx] [VOC]	0.4/0.4 0.8/0.7
MOB-06	AB923 Medium-Duty Vehicle High-Emitter Identification Program [NOx] [VOC]	0.5/0.6 0.5/0.6
	Total VOC	<u>10.4/19.3</u>
	NOx	<u>6.8/9.2</u>
	SOx	<u>3.0/3.0</u>
	PM2.5	<u>1.5/3.3</u> <u>2.9/5.4</u>

¹ The emission reduction estimates are based on the 2014 annual average inventory and 2023 planning inventory in the Proposed Modifications to the Draft 2007 AQMP. The actual reductions are subject to change during rulemaking based on the latest available emission inventory data.

² Emission reductions resulting from the implementation of this control measure will be credited towards AQMD's SIP obligation provided ARB does not develop a similar regulation. Any remaining excess reductions will then contribute to fulfilling ARB's SIP commitment. Reductions for this measure are not included in total reductions in this table.

³ Emission reductions from the past and future projects under the Carl Moyer Program presented under this measure are not included in total reductions in this table. Emission reductions associated with the past and future projects are reflected in the baseline adjustments and under the proposed mobile source control measures, respectively.

TABLE 4-2B

District's Short-Term and Mid-Term Stationary and Mobile Source
Control Measures Without Emission Reduction Estimates

Control Measure #	Title
<u>Remaining 2003 AQMP Revision Control Measures</u>	
BCM-05	Emission Reductions from Under-Fired Charbroilers [PM]
MCS-02	Urban Heat Island [All Pollutants]
MCS-08	Clean Air Act Emission Charges of \$5,000 Per Ton of VOC Fees for Stationary Sources Emitting Over 10 Tons per Year [VOC and NOx]
CMB-04	Natural Gas Fuel Specifications [NOx]
MCS-04	Emissions Reduction from Green Waste Composting [VOC, PM2.5]
FLX-01	Economic Incentive Programs [All Pollutants]
MOB-01	Mitigation Fee for Federal Sources [All Pollutants]
<u>New Control Measures</u>	
CTS-02	Clean Coating Certification Program [VOC]
FUG-01	Improved Leak Detection and Repair [VOC]
FUG-03	Emission Reductions from Cutback Asphalt [VOC]
FUG-04	Emission Reductions from Pipeline and Storage Tank Degassing [VOC]
BCM-01	PM Control Devices (Baghouses, Wet Scrubbers, Electrostatic Precipitators, and Other Control Devices [PM2.5])
BCM-02	PM Emission Hot Spots -Localized Control Program [PM2.5]
BCM-04	Additional PM Emission Reductions from Rule 444 - Open Burning [PM2.5]
MCS-03	Energy Efficiency and Conservation [NOx]
MCS-06	Improved Start-up, Shut-down & Turnaround Procedures [All Pollutants]
MCS-07	Application of All Feasible Control Measures [All Pollutants]
EGM-02	Emission Budgets and Mitigation for General Conformity Projects [All Pollutants]
EGM-03	Emissions Mitigation at Federally Permitted Projects [All Pollutants]
MOB-02	Expanded Exchange Program [All Pollutants]
MOB-03	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Facilities [All Pollutants]
MOB-07	Concurrent Reductions from Global Warming Strategies [All Pollutants]

Stationary Source Control Methods and Associated Emission Reductions

Stationary source control measures rely on a variety of control technologies and management practices, as identified in Table 4-3. Control technologies vary according to the source type and pollutant being controlled and generally include a process or physical modification such as product reformulation, installation of air pollution control equipment, etc. In addition, management practices include administrative changes such as improved leak detection techniques, inspection and maintenance programs, etc.

TABLE 4-3

Stationary Source Control Methods

Source Category	Control Method
Coatings and Solvents	<ul style="list-style-type: none"> • Reformulation • Higher Transfer Efficiency • Process Improvements • Add-On Controls • Alternative Coating and Solvent Application Methods • Market Incentives • Improved Housekeeping Practices
Petroleum Operations and Fugitive VOC Emissions	<ul style="list-style-type: none"> • Process Modifications • Add-On Controls Systems • Market Incentives • Enhanced Inspection and Maintenance • Improved Vapor Recovery Systems • Good Management Practices
Combustion Sources	<ul style="list-style-type: none"> • Add-On Controls • Market Incentives • Process Improvement • Improved Energy Efficiency
Fugitive Dust Sources	<ul style="list-style-type: none"> • Road Dust Suppression • Watering or Revegetation of Disturbed Surface Areas • Chemical Stabilization of Unpaved Areas • Track-Out Prevention • Reduced Vehicular Speeds on Unpaved Roads
Multiple Component Sources	<ul style="list-style-type: none"> • Add-On Controls • Process Modifications and Improvements • Add-On Controls • Best Management Practices • Best Available Control Technology • Market Incentives • Energy Efficiency and Conservation

TABLE 4-3 (continued)
Stationary Source Control Methods

Source Category	Control Method
Compliance Flexibility Programs	<ul style="list-style-type: none"> • Compliance Flexibility to Lower Costs • Promotion of Early Reductions • Incentivize Clean Technologies • Investment in Clean Technologies
Emission Growth Management	<ul style="list-style-type: none"> • Emission Increase Mitigations • Mitigation Fees

The following text provides a brief description of the District's short-term and mid-term measures for the eight groups of control measures: Group 1 – Coatings and Solvents; Group 2 – Petroleum Operations and Fugitive VOC Emissions; Group 3 – Combustion Sources; Group 4 – PM Sources; Group 5 – Multiple Component Sources; Group 6 – Compliance Flexibility Programs; Group 7 – Emission Growth Management; and Group 8 - District's Mobile Source Control Measures.

Coatings and Solvents

The category of coatings and solvents is primarily targeted at reducing VOC emissions from these VOC-containing products. This category includes four proposed control measures that are based on additional emission reductions from lubricants, consumer products used by commercial and institutional facilities or not regulated by CARB, and a Clean Coating Certification program.

CTS-01 – EMISSION REDUCTIONS FROM LUBRICANTS: This control measure would seek to reduce VOC emissions from industrial lubricants, a category under solvent operations, over a defined implementation period. Lubricants are used by various companies in the Basin including, but not limited to, machine shops, auto rebuilders, and auto parts manufacturers. Lubricants are believed to emit a significant amount of VOCs, as many lubricant compounds consist of at least 50 percent VOC solvents. It is important to note that there are low-emitting alternatives to petroleum-based lubricants available, including synthetics, semi-synthetics, and vegetable oils. Thus, the reduction requirements may apply to the end user, but may also be imposed at the point of sale.

CTS-02 - CLEAN COATING CERTIFICATION PROGRAM: VOC content in various industrial coatings has been regulated for many years. Many compliant products are significantly lower than the current rule limits. This measure is designed to encourage and to recognize super_compliant products. This proposed control measure would seek to implement an ultra-low VOC content certification

program for coatings similar to the certification program for the ultra-low VOC solvents under Rule 1171 or Rule 1122. The District's certification can be an effective marketing tool that could encourage manufacturers to voluntarily lower their VOC content below the limits. This control measure would incorporate a Clean Air Coating Certification through amendments to existing rules under Regulation II - Permits and XI – Source-Specific Standards, as well as be considered in any future regulatory development. The District will explore the feasibility of a voluntary program, as well as mandatory participation through source-specific rules. This method of control will include public education, outreach, and various marketing elements to help incentivize manufacturers and create consumer awareness and demand.

CTS-03 – CONSUMER PRODUCT CERTIFICATION AND EMISSION REDUCTIONS FROM USE OF CONSUMER PRODUCTS AT INSTITUTIONAL AND COMMERCIAL FACILITIES: Consumer products are defined under the California Health and Safety Code as chemically formulated products used by institutional and household consumers. This control measure would seek to reduce VOCs from consumer products used at commercial and institutional facilities by developing new rules or programs to establish a VOC certification program, and to incentivize the use of ultra low- or zero-VOC consumer products at high volume commercial and institutional facilities. The certification criteria for consumer cleaning products used at institutional and commercial facilities was adopted by the District's Governing Board in April 2007.

CTS-04 – EMISSION REDUCTIONS FROM THE REDUCTION OF VOC CONTENT OF CONSUMER PRODUCTS NOT REGULATED BY THE STATE BOARD: Consumer Products include a broad range of products that are regulated by CARB in the State of California. However, local Air Pollution Control Districts may develop requirements for consumer products that are not regulated by ARB, such as paint thinners. This control measure would seek to reduce VOC emissions from unregulated lacquer and paint thinners sold as consumer products by establishing a VOC content limit for each of those categories.

Petroleum Operations and Fugitive VOC Emissions

This category pertains primarily to operations and materials associated with the petroleum, chemical, and other industries. Within this category, there is one proposed control measure targeting fugitive VOC emissions with improved leak detection and repair. Other proposed measures include reductions from gasoline transfer and dispensing, pipeline and storage tank degassing, and cutback asphalt facilities.

FUG-01 – IMPROVED LEAK DETECTION AND REPAIR: Proposed Control Measure FUG-01 affects a variety of VOC emissions sources including, but not limited to, oil and gas production facilities, petroleum refining and chemical products processing, storage and transfer facilities, marine terminals, and other sources, where VOC emissions occur from fugitive leaks in piping components, wastewater system components, and process and storage equipment leaks. Most of these facilities are required under District and federal rules to maintain a leak detection and repair (LDAR) program that involves individual screening of all of their piping components and periodic inspection programs of equipment to control and minimize VOC emissions. This measure is taking advantage of the latest technology, called optical gas imaging (Smart LDAR), using an infrared camera that readily detects and displays an image of a VOC leak in a manner that is less time consuming and labor intensive. The control measure would be implemented in two phases: Phase I would consist of a pilot program, followed by Phase II, during which full implementation would be expected. There are no emission reductions quantified for this control measure.

FUG-02 – EMISSION REDUCTIONS FROM GASOLINE TRANSFER AND DISPENSING FACILITIES: This proposed control measure applies to all gasoline dispensing facilities (GDF) in the District. The proposed measure seeks to reduce VOC and toxic emissions from GDF operations by improving the implementation of the CARB enhanced vapor recovery (EVR) regulation. The proposed methods of control include improvement of the functions of the in-station diagnostic (ISD) to provide early alerts of vapor recovery degradation and allow preventative repairs. The methods of control also redefine the function of the reset button of the ISD to allow dispensing of gasoline only after all the defective components of the vapor recovery system are repaired. The proposed methods of control include the installation of a “shutdown” mechanism in the fuel line to stop fueling if the fueling flow rate drops below the system certification standards which may cause vapor recovery failure. The complete implementation of the EVR will achieve a 98 percent control efficiency of GDF emissions.

FUG-03 – EMISSION REDUCTIONS FROM CUTBACK ASPHALT: The purpose of this proposed control measure is to reduce emissions from asphalt paving applications by limiting the use of cutback asphalt and/or replacing it with emulsified asphalt. U.S. EPA Region 9 noted that District Rule 1108 - Cutback Asphalt does not contain RACT for asphalt paving (i.e. seasonal and usage limitations). U.S. EPA recommended staff to consider this option in the 2007 AQMP. In the District's RACT submittal to EPA, a commitment was made to evaluate the potential for limiting the use of cutback asphalt. This control measure is intended to fulfill this commitment.

FUG-04 – EMISSION REDUCTIONS FROM PIPELINE AND STORAGE TANK DEGASSING: The purpose of this proposed control measure is to reduce emissions from pipeline and storage tank degassing and cleaning by requiring the vapor space exhaust to be vented to an air pollution control device that limits the exhaust concentration. The source category would be expanded to include previously unregulated aboveground storage tanks with capacities less than 19,815 gallons and pipeline degassing. The Reid vapor pressure limit for liquids subject to the rule would also be reduced. The same control devices used for tank degassing would be applicable to the expanded category sources. This control measure would impact refineries, chemical plants, gasoline stations, and an unknown number of new facilities in the paint, solvent, adhesive, and ink manufacturing industries.

Combustion Sources

This category includes four proposed measures for stationary combustion equipment. There is one control measure reducing NO_x from non-RECLAIM ovens, dryers, and furnaces. A second proposed measure seeks the reduction of SO_x emissions from RECLAIM facilities. In addition, there is one new proposed control measure that seeks to further reduce NO_x emissions from space heaters. The last measure seeks to specify fuel standards for natural gas used in stationary sources as a means of preventing potential increase in NO_x emissions.

CMB-01 – NO_x REDUCTIONS FROM NON-RECLAIM OVENS, DRYERS AND FURNACES: This proposed control measure applies to ovens, dryers and furnaces, incinerators and other external combustion equipment at non-RECLAIM facilities. Some of these equipment have NO_x emission limits based on BACT/LAER requirements at the time the equipment was permitted. In addition, equipment exempt from permit requirements are not currently subject to NO_x controls. NO_x emissions from these types of equipment can be reduced using low-NO_x burners through retrofit or replacement. NO_x emission reductions of 50 to 75% are achievable for the equipment which is not subject to current BACT limits.

CMB-02 – FURTHER REDUCTIONS OF SO_x FOR RECLAIM (BARCT): This proposed control measure identifies a series of control approaches that can be implemented as part of the Best Available Retrofit Control Technology (BARCT) from the SO_x RECLAIM program. The District will seek further reductions in SO_x allocations from the year 2011 through 2014.

CMB-03 – FURTHER NO_x REDUCTIONS FROM SPACE HEATERS: This control measure applies to natural gas-fired residential (and commercial) space heaters used for comfort heating. District Rule 1111 - NO_x Emissions from Natural Gas-Fired Fan Type Central Furnaces regulates space heaters with input rates less than 175,000 Btu/hr. This measure proposes to establish more stringent emission

limit for new space heaters which can be achieved through the use of low-NOx burners or other technologies. This control measure will be implemented through an amendment to Rule 1111.

CMB-04 – NATURAL GAS FUEL SPECIFICATIONS:

This control measure proposes to develop a two-component District regulation. The first component will include monitoring and testing of natural gas supplies to enhance quantification of emission changes attributable to gas quality higher than a Wobbe Index of 1360. Additional studies will also be conducted to further refine emission factors by equipment type. The District will also work with stakeholders to assess emission impacts based on the data collected during this phase of rule implementation. The second component will include a Wobbe Index of 1360 or equivalent mechanism/parameter and establish mitigation measures that would mitigate any emission increases in the same time frame. The District will follow a two-step public hearing procedure which will provide a per-hearing to receive input on the rule approach prior to the adoption hearing before the District Governing Board.

~~The purpose of this new control measure is to prevent emission increases from the combustion of natural gas with uncharacteristically high heating value (HHV) in stationary applications. The high heating value of such gas relative to natural gas with a lower heating value will result in increased combustion temperature and higher NOx emissions. This control strategy considers setting an upper limit of the heating value of natural gas. Natural gas producers/suppliers could achieve the objective of this control strategy by either not supplying hot gas to the District, removing higher hydrogen compounds, adding inert gases, and/or blending natural gas from different sources so that the end users supply meets a Wobbe Index of 1360 Btu/scf in the District. The District will continue data collection to further determine the relationship between the HHV for natural gas fuel and NOx emissions from gas-fired equipment. Based on this information, the District will make a final determination about the potential emission reductions that can be realized from this measure. However, the emission reduction potential of this measure exceeds more than 1 ton per day of NOx.~~

PM Sources

This category includes three new proposed control measures which would require further reductions in fugitive dust emissions from PM control devices, a localized control program and an enhanced open burning program. The localized controls would be introduced in high PM areas to reduce community exposure. There are also two control measures that have been carried over from the 2003 AQMP, i.e., PM reductions from wood stoves and fireplaces and charbroilers.

BCM-01 - PM CONTROL DEVICES (BAGHOUSES, WET SCRUBBERS, ELECTROSTATIC PRECIPITATORS, OTHER DEVICES): This proposed control measure seeks to further reduce PM emissions from add-on control devices previously identified to achieve PM reductions (e.g., BACT or command-and-control requirements). ~~District AQMD~~-rules establish particulate matter emissions limits and visible opacity standards that may be achieved with baghouse control equipment, electrostatic precipitators, wet scrubbers, or other PM control devices. This measure would establish requirements similar to Rule 1156 (cement operations) to establish and maintain operation and maintenance (O&M) procedures, install and operate Continuous Opacity Monitor System (COMS) or Bag Leak Detection System (BLDS) for top process emitters..

BCM-02 – PM EMISSION HOT SPOTS – LOCALIZED CONTROL PROGRAM: This proposed new control measure seeks to reduce PM emissions in areas where local influence is the main contributor to the overall exposure. Due to the broad nature of the Basin with areas at various stages of economic development, certain locations may be prone to significantly higher levels of PM as compared to the broader surrounding area. For example, the highest levels of PM10 concentrations are measured at the ~~District AQMD's~~ Rubidoux monitoring station. Primary contributors to those levels are sources of crustal material (better known as entrained fugitive dust). In and around the area of the Rubidoux monitoring station there are unstabilized vacant lots, many roads have unimproved road shoulders and are thereby not subject to street sweeping, and some roads and residential parking areas are unpaved. This proposed control measure would establish a localized program to supplement the regional approach to address PM hot spots through a cooperative effort with local agencies to reduce emissions from direct sources of PM.

BCM-03 – EMISSION REDUCTIONS FROM WOOD BURNING FIREPLACES AND WOOD STOVES: The 2003 AQMP included a control measure to reduce emissions, primarily PM, from wood burning fireplaces and wood burning stoves. Control options identified include voluntary or mandatory wood burning curtailment during periods of poor air quality; prohibiting the installation of indoor or outdoor uncontrolled fireplaces in new or existing developments; public outreach and education; moisture content requirements for wood sold as seasoned; change-out of wood heating appliances during property transfers, and prohibition of burning non-wood items; and implementation of a gas-log exchange incentive program. PM emission reductions have been quantified for mandatory wood burning curtailments in other areas and the Bay Area and Sacramento AQMDs have estimated emission reductions for new residential development standards. PM2.5 emission reductions are estimated at 1.0 ton per day by 2014 at a cost effectiveness of \$11,000 to \$17,000 per ton reduced. ~~It should be noted that AQMD staff is currently working on development of a regulation to implement this measure.~~

BCM-04 – ADDITIONAL PM EMISSION REDUCTIONS FROM RULE 444 – OPEN BURNING]: This control measure seeks to reduce PM emissions through further reduction of open burning practices. The Open Burning rule was adopted to reduce visible emissions and minimize public nuisance from smoke emissions. The rule now includes limits on prescribed and agricultural burning. PM emission reductions may be achieved through the establishment of “no burn days” based on a PM_{2.5} threshold of the current 24-hour standard of 65 µg/m³ or the future standard of 35 µg/m³. Additional PM emission reductions may also be achieved through the phasing-out of agricultural burning by 2015, similar to San Joaquin Valley APCD’s reduction strategy. Other measures include the establishment of stricter criteria for training burns that are conducted for fire protection purposes.

BCM-05 – EMISSION REDUCTIONS FROM UNDER-FIRED CHARBROILERS: This control measure seeks to stimulate technology advancement in reducing PM emissions from under-fired charbroilers of which a significant fraction is in the PM_{2.5} range. In December 2004, a finding of infeasibility was made by the Governing Board for under-fired charbroilers due to the lack of identification of any cost-effective control technology. Emission substitutions were made for the purposes of the SIP. Monies were granted to support demonstration projects for possible controls but no applications have been received. However, since that time, additional efforts by the Bay Area AQMD have led to a proposed regulation to reduce PM emissions from high volume under-fired charbroilers by 90%. Implementation of a similar measure for the District will generate approximately 1.1 tons per day PM_{2.5} emission reductions by 2014 through the installation of new and retrofit control equipment (e.g., electrostatic precipitators or HEPA filters) at a cost effectiveness of about \$13,000 per ton reduced. On this basis, staff proposes this measure with the intent of stimulating technology advancement in the next few years and possible implementation prior to 2014.

Multiple Component Sources

There are a total of eight control measures proposed in this category. The first measure seeks reductions of all criteria pollutants through the modernization of permitted equipment and the application of super-compliant materials. The approach for this measure is to either replace or retrofit existing equipment at the end of a pre-determined life span with BACT and utilize supercompliant materials. In addition, a new control measure has been proposed to promote energy efficiency and conservation.

Two control measures are included in this category that address VOC and ammonia emissions from non-dairy livestock waste and composting operations. A third measure promotes the use of lighter color roofing, road materials, or tree planting.

Additional measures seek to minimize emissions during equipment startup and shutdown and reduce emissions by applying the state requirement of all feasible control measures. Finally, the control measure on the potential emission charges for major stationary sources (pending non-attainment of the 1-hour ozone standard in 2010) has been carried from the 2003 AQMP.

MCS-01 - FACILITY MODERNIZATION: This proposed measure is designed to achieve further emission reductions from permitted sources by means of facility modernization and use of supercompliant materials. Existing equipment would be retrofitted or replaced with BACT at the end of a pre-determined lifespan. Concerns regarding potential offset requirements due to equipment replacement will be addressed during rule development. The District would work with the legislature to develop federal and/or state tax credits to encourage early replacement of equipment. Consideration will be given to prior investment in equipment retrofits. During rule development, staff will explore opportunities to provide temporary emission reduction credits for meeting BACT earlier than required by the control measure.

MCS-02 – URBAN HEAT ISLAND: This proposed measure seeks to provide incentives for voluntary actions to reduce VOC or NO_x by lowering the ambient temperature through the use of lighter colored roofing and paving materials. This measure is implemented in part through the U.S. EPA's Cool Communities Program. The U.S. EPA and the District have been moving forward with the promotion of the use of lighter color roofing and paving materials. Several demonstration projects are currently being conducted nationally (one with the City of Los Angeles). In addition, tree planting programs are being promoted throughout the region. The District has sponsored several studies to further quantify the benefits of these actions.

MCS-03 – ENERGY EFFICIENCY AND CONSERVATION: This proposed control measure seeks to provide incentives for businesses to use energy efficient equipment in the District and increase the effectiveness of energy conservation programs. The District will work with local governments to promote energy conservation programs, and with electric and natural gas utilities to identify source categories and provide additional incentives for property owners and businesses to purchase energy efficient equipment. The District may also examine its market incentive or fee programs to identify opportunities for implementation of energy conservation and efficiency measures.

MCS-04 – EMISSIONS REDUCTION FROM GREENWASTE COMPOSTING: Greenwaste composting is an important component of the solid waste industry; it provides resource conservation through source reduction, recycling, and reuse. However, as with other industrial processes, greenwaste composting produces air emissions that are largely uncontrolled. Greenwaste composting is a direct source of fine particulate dust (PM₁₀), volatile organic

compounds (VOC), and ammonia (NH₃), a precursor of particulate matter. Greenwaste composting also releases carbon dioxide, water vapor, and methane, which are greenhouse gases. Although PM₁₀ emissions are unknown at this time, greenwaste composting results in approximately 4.4 tons per day VOC and 1 ton per day NH₃. This control measure calls for the development and implementation of Best Management Practices (BMPs) that would aim for reductions of PM_{2.5}, and VOC. The District will convene a working group to involve all stakeholders in developing wholesale solutions to reduce greenwaste emissions.

MCS-05 - EMISSION REDUCTIONS FROM LIVESTOCK WASTE: Although confined animal facilities have been relocating out of the District's jurisdictional boundaries for years, the District retains over nine million poultry (egg layers and broilers) and more than 15,000 hogs and pigs (swine). In accordance with SB 700 (Florez) – Agricultural Sources, ~~DistrictAQMD~~ adopted Rule 223 – Emission Reduction Permits for Large Confined Animal Facilities, that requires permitting and other requirements for large confined animal facilities. Additional VOC and NH₃ emission reductions, above those required by Rule 223, could be achieved by requiring air pollution control devices (i.e., biofilters) where technically and economically feasible. For example, ~~DistrictAQMD~~ Rule 1133.2 – Emission Reductions from Co-Composting Operations includes a requirement for control devices at large-scale composting facilities with required efficiencies ranging from 70 to 80 percent from the baseline uncontrolled emissions. This proposed control measure would aim to require the Class Two Mitigation Measures of Rule 223 with a higher level of overall control efficiency for the larger facilities subject to Rule 223, and seek reductions from the smaller facilities not subject to the rule.

MCS-06 – IMPROVED STARTUP, SHUTDOWN, AND TURNAROUND PROCEDURES: This proposed control measure seeks to reduce emissions during equipment startup, shutdown, and turnaround. Environmental organizations and community action groups have identified the minimization or optimization of these operations as a means to further reduce emissions. Opportunities for these emission reductions potentially apply at refineries as well as other industries. Examples of possible areas for improvement include better engineering and equipment design, diverting or eliminating process streams that are vented to flares, and installation of redundant equipment to increase operational reliability.

MCS-07 - APPLICATION OF ALL FEASIBLE MEASURES: This control measure addresses the attainment of further emission reductions through the amendment of existing RECLAIM and non-RECLAIM rules and regulations. In particular, existing regulations on VOC coatings and solvents would be targeted for further emission reductions as well as rules and regulations for other pollutants such as NO_x and SO_x. Existing rules and regulations for pollutants such as VOC, NO_x, SO_x and PM reflect current best available retrofit control technology (BARCT).

However, BARCT continually evolves as new technology becomes available that is feasible and cost-effective. Through this proposed control measure, the District would commit to the adoption and implementation of the new retrofit control technology standards.

~~MCS-08 – CLEAN AIR ACT EMISSION CHARGES OF \$5,000 PER TON OF VOC FEES FOR STATIONARY SOURCES WITH POTENTIAL TO EMIT OVER 10 TONS PER YEAR:~~ Due to recent court decision on the one-hour ozone standard, this control measure proposes that if the federal one-hour ozone ambient air quality standard is not met by the year 2010, the District shall impose an emissions fee of \$5,000 (1990 dollars) per ton of VOC and NO_x, emitted by each major source in excess of 80 percent of the sources' baseline emissions. The fee rate will be adjusted to reflect increases in Consumer Price Index since 1990 and annually to reflect increases in the ~~CPI~~consumer price index. The fee shall be paid for each calendar year after the year 2010 and until the standard is met. Furthermore, this fee will be in addition to the annual emission fee required by ~~District SCAQMD~~Rule 301.

Compliance Flexibility Programs

This category includes a proposed control measure carried over from the 2003 AQMP that enhances regulatory compliance by providing additional flexibility and compliance options thereby lowering compliance costs and incentivizing early reductions and advancement of clean technologies. A second control measure was mentioned in the 2003 AQMP but not previously listed as a control measure. This measure is a pilot program that could be used by the Petroleum Refining businesses as a compliance option to achieve their emission reduction obligations through either on-site or off-site controls.

FLX-01 – ECONOMIC INCENTIVE PROGRAMS (: Proposed Control measure FLX-01 (Intercredit Trading Program) is designed to complement command-and-control measures. The primary objectives of this measure are to enhance regulatory compliance flexibility by providing additional compliance options and thereby lowering compliance costs, and to incentivize early reductions and advancement of clean technologies through emission credit provisions. Regulatory flexibility programs, such as District credit rules and the Air Quality Investment Program, are essential to the successful introduction of the advanced control measures. The District will continue to develop incentive-based credit generation rules to provide technology advancement or early implementation of mobile, area, and stationary source emission reduction projects. Credit rules may be developed for use in RECLAIM, command-and-control programs, or for use by projects subject to New Source Review (Regulation XIII). The U.S. EPA Economic Incentive Program (EIP)

guidance would be considered in development of rules to help facilitate CARB and EPA review and approval.

FLX-02 - PETROLEUM REFINERY PILOT PROGRAM: This proposed control measure is a pilot program that is geared to provide an alternative means of compliance to existing refineries by allowing them to achieve their emission reduction obligations by reducing emissions from on-site or off-site projects. Based on a recommendation provided in the 2003 AQMP, the District initiated a collaborative multi-stakeholder process to consider whether to implement this approach as a pilot program for refineries in the Basin. This process has been ongoing since the initial July 2005 Working Group meeting. If such a program is adopted, then upon achieving at least the equivalent reductions, the pilot program would subsume any short- and mid-term control measures and long-term reduction (if any) obligations proposed in the Draft 2007 AQMP for the refinery sector.

The implementation of this pilot program does not preclude future adjustments to the overall reduction targets established for this source category if warranted by attainment demonstrations or inventory changes in future SIP revisions.

Emission Growth Management

There are three proposed control measures within this category. The first measure addresses emission reductions from new or redevelopment projects. Projects will evaluate significant air emissions pursuant to the California Environmental Quality Act (CEQA). The ~~DistrictAQMD~~ will encourage developers and local agencies to participate in a mitigation program. The last two new control measures address the General Conformity projects. The first of these measures creates a budget and mitigation program for these projects. The second measure addresses the impacts of these projects at federally permitted projects.

EGM-01 - EMISSION REDUCTIONS FROM NEW OR REDEVELOPMENT PROJECTS: The purpose of this proposed control measure is two-fold: (1) compliance with the “all feasible measures” requirement of the state law, and (2) capturing emission reduction opportunities during project development phase. The ~~DistrictAQMD~~ convened a working group made up of stakeholders from industry, local governments, and community representatives. Three working group meetings were held and staff prepared the following approach: ~~DistrictAQMD~~ will put forth a plan that contains a control measure which will establish applicability criteria for new or redevelopment projects and will involve the selection of mitigation measures from a menu of technically feasible mitigation options.

EGM-02 - EMISSION BUDGET AND MITIGATION FOR GENERAL CONFORMITY PROJECTS: A General Conformity determination is required by

the federal Clean Air Act (CAA) for federal actions other than transportation actions. The requirements for General Conformity are contained in the federal Clean Air Act (CAA) and must, in general, support the goals of the State Implementation Plan (SIP). One method of determining conformity is for the District to identify applicable emission budgets for the federal agencies to determine if the total of the direct and indirect emissions from the General Conformity project meets the emission budget in the SIP. The District proposes to make this determination through a combination of setting aside emissions from each source category, offsetting emissions exceeding budgets, and mitigation fees.

EGM-03 - EMISSIONS MITIGATION AT FEDERALLY PERMITTED PROJECTS: This control measure addresses mitigation measures for federally permitted projects impacting the District. This need for mitigations was the result of a recently proposed liquefied natural gas facility to be located in federal waters offshore of Ventura County. While this project is located within Ventura County and must obtain an air permit from the U.S. EPA, the Basin is downwind and will be directly impacted by the proposed project and the quality of natural gas may significantly affect the District's progress towards achieving air quality goals in the Basin.

District's Mobile Source Control Measures

In order to complement the proposed state and federal source control strategies, the District is proposing seven local control measures aimed at achieving additional emission reductions from mobile sources, described below. One control measure seeks to impose a mitigation fee program on federal sources such as planes, trains, and ships in order to fund emission reduction projects. The second measure promotes accelerated turnover of in-use small off-road engines (SORE) and other engines such as recreational outboard engines through expanded exchange programs. The third measure introduces backstop measures for indirect sources of emissions from ports and port-related facilities. The District will exercise its existing legal authority or seek additional authority to adopt and implement these measures. Four new control measure are also added based on implementation of the Carl Moyer Program, identification and repair (or retirement) of high-emitting vehicles, and concurrent emission reductions from global warming strategies.

MOB-01 – MITIGATION FEE PROGRAM FOR FEDERAL SOURCES: In order to achieve a fair share reduction commitment from federal sources, this new control measure proposes to implement a mitigation fee program which is to be adopted by U.S. EPA with the mitigation fee to be paid by federal sources through EPA rulemaking and/or U.S. EPA grants to the District. Federal sources include emission source categories such as aircraft, ocean-going vessels, trains, and pre-

empted off-road equipment that are under the jurisdiction of U.S. EPA. These sources continue to represent a significant source of emissions in the Basin in the absence of adequate federal regulations. Under this control measure, the District will use the monies collected to implement strategies for both federal and non-federal sources to achieve equivalent reductions for SIP purposes. Projects funded by the Mitigation Fee Program for federal or other sources would be selected based on specific criteria, including but not limited to: quantifiable emission benefits, emission reduction potential, cost-effectiveness, and proximity to affected areas (e.g., environmental justice areas). These projects would have to be approved by the District's Governing Board.

MOB-02 – EXPANDED EXCHANGE PROGRAM: In order to increase the penetration of electric equipment or new low emission gasoline-powered equipment, this control measure seeks to expand the existing lawn mower/leaf blower exchange programs. This expansion will be accomplished by increasing the number of exchange events and available funding for these programs. In addition, other small off-road equipment (SORE) equipment, as well as recreational outboard engines used in pleasure craft, may also be considered for exchange programs for accelerating the turnover of existing engines.

MOB-03 - BACKSTOP MEASURE FOR INDIRECT SOURCES OF EMISSIONS FROM PORTS AND PORT-RELATED FACILITIES: This proposed control measure will address emissions from all new and existing stationary and mobile sources at ports and port-related facilities, including nonattainment criteria pollutants and toxics emissions. The objective of this backstop measure is to ensure the adequacy of and effective implementation of port measures and strategies proposed or developed by ports or CARB. Possible control approaches include limitations on increases in health risks caused by toxic air contaminants; reduction of health risks caused by toxic emissions from ports and port projects; prevention of emission increases of nonattainment pollutants for port projects; and emission reduction goals for ports to implement AQMP measures.

MOB-04 – EMISSIONS REDUCTION FROM CARL MOYER PROGRAM : This proposed control measure is based on the implementation of the Carl Moyer Program by the District. The measure proposes to take credit for the emission reductions achieved through past and future projects funded under this program for SIP purposes, in two phases. Examples of projects include on-road heavy-duty vehicle modernization, installation of retrofit units, and engine repowers. Phase I of this control measure is based on the projects implemented from 1998 to 2006. Phase II of this measure is based on the reductions to be achieved from the implementation of new projects under the Carl Moyer Program. These reductions were estimated based on the committed level of funding for this Program and a conservative cost-effectiveness assumption of \$14,300 per ton specified in the Carl Moyer Program

guidelines (although existing projects have substantially lower (better) cost-effectiveness estimates).

MOB-05 – AB923 LIGHT-DUTY HIGH-EMITTER IDENTIFICATION PROGRAM: This measure calls for the identification of high-emitting on-road light- and medium-duty vehicles up to 8,500 lbs gross vehicle weight. The District is currently conducting a pilot program to identify high-emitters using remote sensing technologies. Owners of identified vehicles will be offered the ability to repair or scrap their vehicles as part of the program. The District is currently allocating a portion of the AB 923 funds for this purpose and CARB has developed guidelines to implement the program.

MOB-06 – AB923 MEDIUM-DUTY HIGH-EMITTER IDENTIFICATION PROGRAM: This measure is similar to SCONRD-02 and would include medium-duty and light-heavy-duty vehicles with 8,501 lbs and up to 14,000 lbs gross vehicle weight. Currently, vehicles in this weight category are not subject to in-use testing program. The AB923 program described in MOB-05 could be expanded to cover this category of vehicles.

MOB-07 – CONCURRENT REDUCTIONS FROM GLOBAL WARMING STRATEGIES (ALL POLLUTANTS): Achieving the AB32 greenhouse gas reduction targets would require significant development and implementation of energy efficiency technologies and extensive shifting of energy production to renewable sources. In addition to reducing GHG emissions, such strategies could concurrently reduce emissions of criteria pollutants associated with fossil fuel combustion. This control measure proposes to quantify the concurrent emission reductions associated with Statewide GHG programs targeted at stationary and mobile sources in the Basin working with various state agencies. Every three to five years, concurrent emission reductions associated with these programs will be quantified and incorporated in the revised baseline emissions as part of the SIP revision process.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS' (SCAG'S) REGIONAL TRANSPORTATION STRATEGY AND CONTROL MEASURES

Transportation plans within the Basin are statutorily required to conform to air quality plans in the region, as established by the 1990 Federal Clean Air Act and subsequently reinforced by the Intermodal Surface Transportation and Efficiency Act (ISTEA), Transportation Equity Act for the 21st-Century (TEA-21) and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU).

The region must demonstrate that its transportation plans and programs conform to the mandate to meet the NAAQS in a timely manner. The regulations governing the implementation of transportation projects within air basins are stipulated in U.S. EPA's Transportation Conformity Rule (40 CFR Parts 51 and 93) and also the Joint Federal Highway Administration (FHWA)/Federal Transit Administration (FTA) regulations, "Planning Assistance and Standards," 23 CFR Part 450 and 49 CFR Part 613.

The long-term transportation planning requirements for emission reductions from on-road mobile sources within the Basin are met by SCAG's Regional Transportation Plan (RTP) which is developed every four years with a 20-year planning horizon. The short-term implementation requirements of the Transportation Conformity Rule are met by SCAG's biennial Regional Transportation Improvement Program (RTIP), the first two years of which are fiscally constrained and demonstrate timely implementation of a special category of transportation projects called Transportation Control Measures (TCMs).

The region is required to identify TCMs, as specified in the Federal Clean Air Act (Section 108 (f)(1)(A)) and also by U.S. EPA's Transportation Conformity Rule (40 CFR Part 93). In the event the region fell out of conformity, only those projects identified as TCMs may go forward. However, once a project is identified as a TCM, certain special conditions and obligations arise.

- **Timely Implementation:** Projects identified as TCMs are tracked for timely implementation. In the event that a particular TCM project is delayed or otherwise fails, a substitute project must be implemented. SAFETEA-LU includes specific requirements on the substitution of TCMs, including similar time frame and emissions reductions, adequate funding and implementation through a collaborative process.
- **Emission Reductions:** In the event that a TCM project is not implemented, an alternative project that provides equal or greater emissions reduction must be provided as a replacement for the original project.
- **Reasonably Available Control Measure (RACM) Analysis:** The region must demonstrate that it has considered all reasonably available control measures, and that projects identified as TCMs have been chosen on the basis of such an analysis.

In general, TCMs are those projects that provide emission reductions from on-road mobile sources, based on changes in the patterns and modes by which the regional transportation system is used. The various strategies considered as part of the 2004

RTP and 2006 RTIP are defined, collectively, as a single TCM, with specific strategies grouped into its following three components:

- **High Occupancy Vehicle (HOV) Strategy:** This strategy attempts to reduce the proportion of commute trips made by single occupancy vehicles - the clearly preferred mode of travel within the Southern California region, constituting over 75% of all home-to-work trips, according to the 2000 U.S. Census - by increasing the share of HOV ridership within the region. HOV lanes are one example of such projects, where particular segments of heavily used freeways are designated for exclusive use by HOV vehicles, particularly during rush-hour traffic. The purpose of such measures is to make car-pooling and ride-sharing practices more attractive to individuals who may otherwise prefer the convenience of a single occupancy vehicle commute trip.
- **Transit and Systems Management:** This strategy relies primarily on the provision of facilities and infrastructure that incentivize an increase in the proportion of regional trips that make use of transit as a transportation mode. Such measures also promote the use of alternative modes of transportation (e.g., bicycle and pedestrian modes) and seek to incentivize increases in the average vehicle occupancy (AVO) or ridership (AVR) by facilitating van-pools, smart shuttles and other such strategies. Systems management measures include projects such as grade separation and traffic signal synchronization.
- **Information-based Transportation:** This strategy relies primarily on the innovative provision of information in a manner that successfully influences the ways in which individuals use the regional transportation system. Typically, such measures seek to induce changes in trip behavior that beneficially influence the congestion and air pollution impacts of travel. One strategy attempts to increase the proportion of ride-sharing and car-pooling trips by providing information that makes it easier to match up people traveling to and from particular sets of origin and destination points. Another strategy attempts to shift the time-profile of demand - thus, transportation demand management (TDM) - by redistributing traffic flows from peak to off-peak hours. This strategy relies on providing single occupancy vehicle operators with realistic and near-real time estimates of congestion using internet-based information networks, in an effort to influence their decision to defer traveling to a less congested time of day.

The TCMs specified in the 2004 RTP, as well as the projects listed for implementation in the first two years of the 2006 RTIP, were developed as part of an extensive and comprehensive decision-making process that actively sought the input of key stakeholders throughout the region. At the culmination of the process, SCAG's Regional Council approved the transportation control measures and strategies included in the 2004 RTP, and subsequently the investment commitments

contained in the 2006 RTIP. These measures and recommendations have accordingly been moved forward for inclusion in the region's air quality plans.

Table 4-4 provides the categories of TCMs as included in the 2006 RTIP, and based on the 2004 RTP, and consistent with the 1994, 1997/99 and 2003 AQMP/SIPs. Listings of the draft 2007 AQMP TCMs and the fiscally constrained projects from the 2004 RTP are contained in Appendix IV-C, Attachments A and B, respectively.

It should be noted that while there have been and continue to be significant improvements in the emission control technology required for on-road vehicles¹, trends assessed as part of the regional transportation planning process indicate that the increase in vehicle emissions resulting from increases in the number of vehicles on the road and the number of vehicle miles they each are driven may overwhelm future benefits from technology improvements. As a result, it is imperative that the region seek alternative and innovative ways to reduce transportation-related air pollution and environmental impacts.

¹ Such measures are outside the definition of TCMs, which are discussed in more detail in Appendix IV-C: Regional Transportation Strategy and Control Measures.

TABLE 4-4

TCM Project Categories

Based on the 2006 Regional Transportation Improvement Program (RTIP)

Project Description
A. High Occupancy Vehicle Measures
<i>HOV projects, and their pricing alternatives</i>
▪ New HOV Lanes – Extensions and Additions to Existing Facilities
▪ New HOV Lanes – With New Facility Projects
▪ New HOV Lanes -- With Facility Improvement Projects
▪ HOV to HOV Bypasses, Connectors, and New Interchanges with Ramp Meters
▪ High Occupancy Toll (HOT) Lanes and Pricing Alternatives
B. Transit and System Management Measures
<i>Bus, rail and shuttle transit expansion and improvements; park and ride lots and inter-modal transfer facilities; bicycle and pedestrian facilities; railroad consolidation programs such as the Alameda Corridor, grade separation projects, channelization, over-passes, underpasses; traffic signalization; intersection improvements</i>
Transit
▪ Rail Track – New Lines
▪ Rail Track – Capacity Expansion of Existing Lines
▪ New Rolling Stock Acquisition -- Rail Cars and/or Locomotives
▪ Express Busways – Bus Rapid Transit and Dedicated Bus Lanes
▪ Buses – Fleet Expansion
▪ Shuttles and Paratransit Vehicles – Fleet Expansion
Intermodal Transfer Facilities
▪ Rail Stations – New
▪ Rail Stations – Expansion
▪ Park & Ride Lots – New
▪ Park & Ride Lots – Expansion
▪ Bus Stations & Transfer Facilities – New
▪ Bus Stations & Transfer Facilities – Expansion
Non-motorized Transportation Mode Facilities (non-recreational)
▪ Bicycle & Pedestrian Facilities - New
▪ Bicycle & Pedestrian Facilities - Expansion
▪ Bicycle Facilities – New
▪ Bicycle Facilities - Expansion
▪ Pedestrian Facilities – New
▪ Pedestrian Facilities - Expansion

TABLE 4-4 (continued)
TCM Project Categories

Based on the 2006 Regional Transportation Improvement Program (RTIP)

<p>C. Information-based Transportation Strategies</p> <p><i>Programs that promote and popularize multi-modal commute strategies to maximize alternatives to single-occupancy vehicle commute trips; marketing and promoting the use of HOV lanes or rail lines to the general public; educating the public regarding cost, locations, accessibility and services available at Park and Ride lots; promoting and marketing vanpool formation and incentive programs; promoting ride-matching services through the Internet and other means of making alternative travel option information more accessible to the general public; Urban Freeway System Management improvements; Smart Corridors System Management programs; Congestion Management Plan-based demand management strategies; county-/corridor-wide vanpool programs; seed money for transportation management associations (TMAs); and TDM demonstration programs/projects eligible for programming in the RTIP.</i></p>
<ul style="list-style-type: none"> ▪ Marketing for Rideshare Services and Transit/TDM/Intermodal Services
<ul style="list-style-type: none"> ▪ Intelligent Transportation Systems/Control System Computerization
<ul style="list-style-type: none"> ▪ Telecommuting Programs/Satellite Work Centers
<ul style="list-style-type: none"> ▪ Real-time Rail, Transit, or Freeway Information Systems (changeable message signs)

The emission benefits associated with the regional transportation strategy are estimated to be 1.8 tons per day of VOC and 0.24 tons per day of PM_{2.5} reductions in 2014 and 1.7 tons per day of VOC and 0.2 ton per day of NO_x reductions in 2023 which are already reflected in the projected emissions. For a detailed discussion of the emission reductions associated with the regional transportation strategy, refer to Appendix IV-C (Regional Transportation Strategy and Control Measures).

Emission reductions have also been estimated for the proposed Goods Movement Control Measures, described in Appendix IV-C, as shown in Table 4-4A. These projects are being developed as part of SCAG's on-going Goods Movement Program as initially set forth in the financially constrained 2004 RTP, which is intended to enable the region to improve the health and well-being of our communities, while more efficiently accommodating freight movement through the region to the economic benefit of Southern California and the rest of the Nation. These measures were included as a component of the 2007 South Coast AQMP transportation strategy approved by SCAG's Regional Council at its May 3, 2007, public meeting. As part of the AQMP development process, the SCAG Regional Council and policy committees received on-going updates on the issues associated with identifying adequate control measures for both PM_{2.5} and 8-hour ozone, as well as data on the significant health impacts to residents of the South Coast Air Basin, especially due to goods movement related sources. Based on this and other relevant information, the Regional Council included a call for action as part of the adoption resolution for

SCAG's portion of the South Coast AQMP. The resolution included recommendations for priority actions to further reduce emissions from goods movement sources, including local, state and federal collaboration, legislative considerations, and implementation of an alternative clean freight movement system.

Table 4-4A
Emission Reductions from Additional
SCAG Goods Movement Control Measures
(NO_x, TPD)

<u>Strategy</u>	<u>2014</u>	<u>2023</u>
<u>High Speed Transport System</u>	<u>14</u>	<u>7</u>
<u>Truck-Only Lanes</u>	<u>8</u>	<u>4</u>
<u>Total</u>	<u>22</u>	<u>11</u>

The 2014 commitment for PM_{2.5} attainment purposes includes a high speed transport system and truck-only lane measures to be implemented by SCAG. CARB will take on the full legal commitment to backstop these reductions only if necessary; however, both SCAG and the District have agreed to an annual review meeting to monitor the implementation of these measures and to explore additional controls that both the District and SCAG can implement to backstop the original measures. These measures are described in Attachment D (Goods Movement Control Measures) of Appendix IV-C.

STATE AND FEDERAL SHORT-TERM AND MID-TERM CONTROL MEASURES

In addition to District and SCAG's measures, the draft 2007 AQMP includes additional short- and mid-term control measures aimed at reducing emissions from sources that are primarily under State and federal jurisdiction, including on-road and off-road mobile sources, and consumer products. These measures are required in order to achieve the remaining emission reductions necessary for PM_{2.5} attainment.

The on-road motor sources category includes passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles, and motorcycles. There are currently approximately 12 million vehicles in this category in the South Coast Basin. In 2002, these vehicles traveled more than 349 million miles per day; they are projected to travel about 407 million miles per day by the year 2020. CARB and U.S. EPA have primary authority to reduce emissions from on-road mobile sources, through the

adoption of emission standards and other related requirements. The District has some restrictions on its authority to impose requirements to reduce emissions from these sources. However, the District has reduced emissions from this source category through its trip reduction requirements for large employers (Rule 2002), public fleet rules, vehicle scrapping programs, and incentive programs.

Off-road mobile sources refer to off-road vehicles and mobile non-vehicular equipment categories such as aircraft, trains, marine vessels, farm and construction equipment (e.g., bulldozers), industrial equipment (e.g., forklifts), and utility equipment (e.g., lawn mowers). The authority to develop and implement regulations for off-road mobile sources lies primarily with the U.S. EPA and CARB. The District has limited authority to adopt retrofit requirements for some off-road mobile sources and has authority to adopt use and operation limits for such equipment.

Consumer products include products such as detergents, polishes, cosmetics, hairsprays, and disinfectants that are used primarily by household and institutional consumers. These products represent a significant source of VOC emissions in the Basin. Overall emissions from this category are determined both by the emissions characteristics of the types of products within the category, and by increases in product usage that are largely tied to population increases. CARB has the authority and responsibility to achieve the maximum technologically and commercially feasible VOC emission reductions from consumer products. However, CARB is prohibited from eliminating a product type (e.g., mode of dispensing).

Since the adoption of the 2003 AQMP, CARB has adopted a number of rules for mobile sources and consumer products as outlined in Table 1-3. However, these reductions fall short of CARB's commitment for its short-term measures in the 2003 AQMP. Collectively, mobile sources and consumer products which are primarily under state and federal jurisdiction account for 72% of VOC (380 t/d), 88% of NO_x (577 t/d), and 63% of SO_x (27 t/d) in 2014. Therefore, a significant component of the PM_{2.5} (and ozone) attainment strategy is based on achieving substantial reductions from these sources.

On ~~April 26, January 31,~~ 2007, CARB released its revised draft Proposed State Strategy for California's 2007 State Implementation Plan which identifies a number of near-term control measures aimed at reducing emissions from mobile sources and consumer products. The Proposed State Strategy includes emission reduction commitments for 2014 for PM_{2.5} attainment and for 2020 and 2023 for ozone attainment. The 2023 commitment for ozone also includes long-term emission reductions under the "new technology" provisions of the Clean Air Act (Section 182(e)(5)). ~~In addition, several potential long term concepts are also presented for achieving the needed reductions for ozone attainment by 2024.~~ As indicated in the State strategy, CARB's proposed mobile source NO_x measures are essential for

attainment of both PM2.5 and ozone standards in the Basin. CARB also acknowledges that the proposed state measures by themselves do not provide adequate level of reductions for PM2.5 attainment by 2015. The reduction gap in CARB's revised draft State strategy is estimated at 74 tons per day of NOx, 7 tons per day of VOC, 1 ton per day of SOx, and 3 tons per day of PM2.5 reductions by 2014 . With SCAG's recently proposed goods movement measures and the District's further commitment to PM2.5 measures, the NOx reduction gap will be reduced to 41 tons per day by 2014. ~~and proposes to delay the PM2.5 SIP submittal until April 2008 (i.e., official due date to U.S. EPA). CARB is proposing to make use of the available time to conduct further technical analyses on modeling and strategy development.~~

The following table identifies the level of reductions committed by each agency to date and the reduction gap for full PM2.5 attainment by 2015:

Table 4-5
Emissions Reductions Needed for PM2.5 Attainment
(2014, Annual Average, tons per day)

	<u>NOx</u>	<u>VOC</u>	<u>SOx</u>	<u>PM2.5</u>
<u>Baseline</u>	<u>654</u>	<u>528</u>	<u>43</u>	<u>102</u>
<u>Emission Reductions:</u>				
<u>District's Stationary Source Measures</u>	<u>7</u>	<u>10</u>	<u>3</u>	<u>3</u>
<u>CARB's State Strategy</u>	<u>122</u>	<u>43</u>	<u>20</u>	<u>9</u>
<u>SCAG's Goods Movement Measures</u>	<u>22</u>	<u>---</u>	<u>---</u>	<u>---</u>
<u>Reduction Gap</u>	<u>41</u>	<u>6</u>	<u>1</u>	<u>2</u>
<u>Total Reductions</u>	<u>192</u>	<u>59</u>	<u>24</u>	<u>14</u>
<u>Remaining Emissions*</u>	<u>454</u>	<u>467</u>	<u>19</u>	<u>87</u>

* Reflects baseline adjustments.

As an alternative to achieving the mix of emission reductions for attaining the PM2.5 standard, CARB has proposed that additional local measures for directly-emitted PM2.5 sources (i.e., residential wood burning, commercial charbroilers, and fugitive dust sources) be considered to close the reduction gap. Based on the District staff's

recent assessment of potential control strategies for these sources, District staff has revised the reduction targets for two of its short-term control measures (i.e., wood-burning fireplaces/woodstoves and under-fired commercial charbroilers) resulting in an additional 1.4 tons per day of PM_{2.5} reductions in 2014. These new reductions are already reflected in Table 4-5. However, according to the District's air quality modeling analysis, reductions from these measures as well as SCAG's new goods movement measures would still not be adequate for PM_{2.5} attainment and additional NO_x reductions would be necessary for PM_{2.5} attainment.

Therefore, in order to ensure full attainment of the PM_{2.5} standard by 2015, the District is proposing that CARB incorporate additional NO_x measures in its State Strategy and commit to an additional 41 tons per day of NO_x reductions by 2014. In order to help achieve these additional reductions, the District has provided a menu of potential mobile source control measures for CARB's consideration (presented under the section entitled, District Staff's Proposed Policy Options to Supplement CARB's Proposed State Strategy, and described in more detail in Appendix IV-B-2).

~~However,~~ Although the PM_{2.5} SIP is not due until April 2008, the District staff believes that an integrated PM_{2.5} and ozone Plan would provide the most a more appropriate control approach given the PM_{2.5} fast-approaching 2014 attainment deadline and the need for achieving substantial levels of emission reductions in the next several years. The District is concerned that if the PM_{2.5} SIP is delayed and the reduction targets are not established now, opportunities for rule development in the 2007/2008 timeframe would potentially be lost delaying the implementation of control strategies and jeopardizing the PM_{2.5} attainment. The District believes that additional emission reduction measures necessary for PM_{2.5} attainment beyond those proposed by CARB are technically and economically feasible through regulatory programs and/or incentive funding programs and should be incorporated into the 2007 AQMP. Therefore, for the ~~proposed modifications to the~~ Draft Final AQMP, the District is proposing a comprehensive control strategy for attaining both PM_{2.5} and ozone standards which would be submitted to U.S. EPA for approval by June 2007.

~~The proposed modifications to the~~ Draft Final 2007 AQMP control strategy for sources under state and federal jurisdiction consist of three ~~two~~ components: 1) CARB's Revised Draft Proposed State Strategy, 2) SCAG's Regional Transportation Strategy and control Measures including the new Goods Movement Measures (presented in the previous section and described in Appendix IV-C); and 3) District Staff's Proposed Policy Options to Supplement CARB's Control Strategy. CARB's draft proposed strategy and the District's proposed policy options are presented in Appendix IV-B-1 and IV-B-2, respectively.

The following section summarizes the proposed state control strategy presented in the next section is modified by District staff to include additional commitments by CARB toward attainment of the PM2.5 and 8-hour ozone standards.

CARB'S PROPOSED STATE STRATEGY

Introduction

CARB staff is proposing a set of new measures to achieve emission reductions to help address California's most challenging ozone and PM2.5 problems. These measures are designed to make progress toward the federal 8-hour ozone standard in the South Coast and the San Joaquin Valley. The measures include near-term NOx and SOx emission reduction goals, reflecting the nature and scope of the PM2.5 problem in these regions. To achieve the emission reductions needed for both ozone and PM2.5, the State Strategy proposes new near-term actions that can be completed by 2010 or soon thereafter.

Need for Fleet Modernization

CARB's mobile source program has moved the State's nonattainment areas closer to meeting federal air quality standards. California has dramatically tightened emission standards for new on-road and off-road mobile sources and fuels. As new engines have become cleaner and cleaner, the emissions contribution from older vehicles has been growing to the extent that it will soon make up the majority of mobile source emissions. For example, by 2014, heavy-duty trucks 14 years or older will produce 51 percent of total heavy-duty truck NOx emissions while only traveling 20 percent of total truck miles. The same holds true for all on-road vehicles combined, where vehicles over 14 years old will produce almost 60 percent of total NOx emissions by 2014 but just 20 percent of total miles traveled.

While California has made significant strides in reducing emissions from mobile sources as they age, the benefits of in-use control programs are limited by the underlying engine technology and controls. The majority of new measures in the State Strategy are in-use measures – programs to help clean up or replace older, dirtier vehicles and equipment. We simply cannot wait for the natural turnover of older vehicles and equipment (1-5 percent annual turnover depending on vehicle or equipment type) being replaced with newer, cleaner vehicles. The challenge is that these measures have a much more direct impact on businesses and individuals in California than do engine standards that have a more direct impact on manufacturers. ARB's fleet rules will affect owners of public and private vehicles and equipment that operate in nonattainment areas throughout the State.

Compliance flexibility has historically been included in CARB regulations – allowing the most cost-effective methods to be used by those who must meet emission requirements. And while lower-cost emission control devices will likely play an important role in lowering emissions from existing mobile fleets, a certain degree of more costly engine and vehicle replacements will be needed to lower fleet emissions. This will place a larger financial burden on owners of vehicles and equipment, so the appropriate role of incentive funds will be an issue. It will be important to prioritize the use of any incentive funds in a way that generates maximum emission reductions and health protection benefits, while helping to reduce the burden for those most in need of financial assistance. It is also important to recognize that the current public funds can pay for only a portion of the cost for necessary modernization of California’s diesel engine fleets.

The nature of the proposed new measures (enforceable rules) and California’s history of supportive financial incentives provide a sound basis for reductions from incentive programs to meet federal requirements for SIP approval.

Accountability for Emission Reductions

California’s SIP must outline the plan for meeting air quality standards in all of its nonattainment areas. When ARB staff proposes its SIP State Strategy for Board approval, it will include an enforceable commitment to achieve the overall goals set. The details of each new measure are publicly considered during separate formal rulemaking processes. If a particular measure does not ultimately achieve the emission reductions estimated in the SIP, the State is still bound to achieve the total aggregate emission reduction commitment, whether this is realized through additional reductions from other new measures, or from alternative control measures or incentive programs.

With respect to the state’s SIP commitment for the South Coast Air Basin’s PM2.5 attainment strategy, CARB is committed to achieve, in aggregate, a total of 163 tons per day of NOx by 2014 as shown in Table 4-6A. Should the future air quality modeling or air quality improvements indicate that not all 163 tons per day are necessary for PM2.5 attainment and infeasibility finding is made for a control measures or a portion thereof at a regularly scheduled public meeting of the CARB with proper public notification, the state’s SIP commitment can be adjusted downward, but at a minimum of 132 tons per day of NOx reductions in 2014. CARB commits to adopt all feasible measures as expeditiously as possible by 2014. The corresponding minimum emission reduction commitments in 2020 and 2023 are also presented in Tables 4-6B and 4-6C, respectively. The District staff believes that the additional 41 tons per day of NOx reductions by 2014 (and the corresponding reductions in 2020 and 2023) are necessary and feasible.

Summary of Proposed New SIP Measures

ON-ROAD SOURCES

Passenger Vehicles

Improvements and Enhancements to California's Smog Check Program

Low Pressure Evaporative Test. Require low pressure evaporative system testing and repair of evaporative system leaks for all vehicles subject to Smog Check inspection.

More Stringent Cutpoints. Set more stringent pass/fail cutpoints to ensure more cars would have more complete and durable repairs.

Annual Inspections for Older Vehicles. Inspect older vehicles annually rather than every two years. Older vehicles tend to have greater deterioration of emission controls, and consequently, higher emissions.

Annual Inspections for High Annual Mileage Vehicles. Inspect annually, rather than every two years, vehicles that accrue very high mileage on an annual basis. High mileage vehicles tend to have greater deterioration of emission controls and, consequently, higher emissions.

Add Visible Smoke Test. As part of the Smog Check test, include a check for visible smoke to identify vehicles with excess particulate matter (PM) emissions.

Inspection of Light- and Medium-Duty Diesels. Include light- and medium-duty diesel vehicles in the Smog Check program to provide for improved maintenance and reduced emissions for this part of the fleet, and require the repair of poorly maintained or old emission systems.

Inspection of Motorcycles. Include motorcycle inspections as part of Smog Check. Studies indicate that motorcycles are subject to high rates of exhaust system tampering.

Expanded Passenger Vehicle Retirement. Increase the number of vehicles that are voluntarily retired by implementing a scrappage program for vehicles that are off-cycle from their Smog Check inspections.

Modifications to Reformulated Gasoline Program. Modify California's Reformulated Gasoline Program to offset ROG emissions due to the increased use of ethanol. This rulemaking

activity is currently underway and is intended to fully mitigate the emission increase, which has been incorporated in the current emissions inventory.

Trucks

Cleaner In-Use Heavy-Duty Trucks. This proposed measure is a comprehensive in-use diesel truck emissions reduction program that includes a fleet modernization rule and an enhanced screening and repair program. Fleet modernization would focus on overcoming the typically slow rate of heavy-duty truck turnover by requiring truck owners to meet specified emission levels through replacing or cleaning up the oldest trucks in their fleets, and would also include a program for out-of-state trucks. ARB's roadside heavy-duty vehicle inspection program would be expanded to more effectively identify and screen trucks that need emission control system repairs.

GOODS MOVEMENT SOURCES

Auxiliary Ship Engine Cold Ironing and Other Clean Technology. Reduce emissions from ships at berth with at-dock technologies such as cold ironing (electrical power) and other clean technologies.

Cleaner Main Ship Engines and Fuel. Further reduce emissions from main engines through added retrofits such as selected catalytic reduction. Support efforts by ports and appropriate local entities to accelerate use of cleaner ships and rebuilt engines through other tools such as lease restrictions. Require ships to use low sulfur diesel fuel in main engines when operating within 24 nautical miles of shore.

Port Truck Modernization. Retrofit or replace older heavy-duty diesel trucks that service ports. Work with port authorities to prevent adding older trucks to the fleet. ARB rulemaking process for this proposed measure has begun.

Accelerated Introduction of Cleaner Line-Haul Locomotives. Replace existing locomotive engines with cleaner Tier 3 engines beginning in 2012 and conduct concurrent rebuilds of older engines to Tier 2.5 standards. This measure can only occur if U.S. EPA adopts Tier 3 engines standards for locomotives.

Clean Up Existing Commercial Harbor Craft. Require owners of existing commercial harbor craft to replace old engines (both propulsion and auxiliary) with newer cleaner engines and/or add emission control technologies that clean up engine exhaust. ARB rulemaking for this proposed measure is underway.

OFF-ROAD SOURCES

Construction and Other Equipment

Cleaner In-Use Off-Road Equipment. Establish fleet average emission limits for off-road equipment (over 25 horsepower) that would require older, dirtier engines to be replaced with engines reflecting current technologies or retrofitted with emission control devices. ARB rulemaking for this proposed measure is in process.

Agricultural Equipment

Agricultural Equipment Fleet Modernization. Accelerate the modernization of the fleet of agricultural equipment used in California, removing older, dirtier equipment from service to be replaced with engines reflecting cleaner technologies.

Evaporative and Exhaust Strategies

New Emission Standards for Recreational Boats. Adopt catalyst-based standards (5 g/kW-hr) for new outboard engines and evaporative emission standards to address all sources of recreational boat evaporative emissions.

Off-Road Recreational Vehicle Expanded Emission Standards. Adopt exhaust and evaporative emission standards to reduce the amount of ROG from off-highway motorcycles and all-terrain vehicles.

Portable Outboard Marine Tank Evaporative Standards. Set evaporative standards for removable fuel tanks used on outboard recreational boats.

Refueling Gasoline Tank Evaporative Standards. Set evaporative standards for refueling gasoline tanks typically mounted on pickups and large recreational vehicles and used to refuel equipment and other smaller vehicles.

Gas Station Refueling Hose Evaporative Standards. Set evaporative standards for gas station pump hoses.

Enhanced Vapor Recovery for Above Ground Storage Tanks. Implement an enhanced vapor recovery certification process and new performance standards and specifications for large fuel tanks used extensively in agricultural operations.

AREAWIDE SOURCES

Consumer Products

Tighten Standards. Tighten standards or require product reformulation for consumer products categories through several rulemakings through 2010.

Pesticides

New Pesticide Strategies. The California Department of Pesticide Regulation will further reduce emissions from commercial and agricultural pesticide use in California through reformulation, reduced usage, and innovative technologies and practices.

The following tables show the expected emission reductions from the CARB's proposed new SIP measures in 2014, 2020, and 2023. It should be noted that the reductions associated with three off-road measures (i.e., portable outboard marine tank, refueling gasoline storage tank, and gas station fueling hose evaporative standards) presented here are not used for SIP purposes since the source categories for these measures are not reflected in the baseline at this time. The following tables also include the additional mobile source control measures proposed by District staff for CARB's adoption as well as CARB's minimum reduction commitments for 2014, 2020, and 2030. The estimated reductions from these additional measures are presented either as the upper end of the range of reductions for several of the State measures or as new control measures which are currently not included in the revised draft State Strategy.

TABLE 4-65A
2014 Expected Emission Reductions from CARB's Proposed New SIP Measures
(tons per day)

Proposed New SIP Measures	NO_x	ROG	PM_{2.5}	SO_x
ON-ROAD SOURCES				
Passenger Vehicles	14.4-21.6	17.7	0.2	--
Smog Check Improvements (BAR)	12.0	10.5	0.2	--
Expanded Vehicle Retirement	2.4	2.8	0.05	--
Modifications to Reformulated Gasoline Program	<u>0-5.2</u>	4.4	--	--
<u>Accelerated penetration of ATPZEVs</u>	<u>0-1</u>			
<u>On-Board Diagnostics (III)</u>	<u>0-3</u>			
Trucks	47.3-72.3	5.1	3.0	--
Cleaner In-Use Heavy-Duty Trucks	<u>47.3-72.3</u>	5.1	3.0	--
GOODS MOVEMENT SOURCES				
49.4-66.4	1.2	3.6	20.3	
Auxiliary Ship Engine Cold Ironing and Other Clean Technology	18.5	--	0.3	0.4
Cleaner Main Ship Engines and Fuel	20.0	--	2.4	19.7
Port Truck Modernization	<u>2.0-8.3</u>	--	0.5	--
Accelerated Introduction of Cleaner Line-Haul Locomotives*	<u>4.3-15.3</u>	0.7	0.2	--
Clean Up Existing Harbor Craft	4.6	<u>NYQ</u> <u>0.5</u>	0.2	--
OFF-ROAD SOURCES				
Off-ROAD EQUIPMENT				
10.5-24.5	2.2	2.5	--	
Cleaner In-Use Off-Road Equipment (over 25hp)	<u>10.5-24.5</u>	2.2	2.5	--
AGRICULTURAL EQUIPMENT				
NYQ	NYQ	NYQ	0	
OTHER OFF-ROAD SOURCES				
0.4-4.0	8.9 16.9	--	--	
New Emission Standards for Recreational Boats	0.4	4.2	--	--
Expanded Off-Road Recreational Vehicle Emission Standards	--	2.4	--	--
Portable Outboard Marine Tank Evaporative Standards ⁽¹⁾	--	0.6	--	--
Refueling Gasoline Storage Tank Evaporative Standards ⁽¹⁾	--	0.3	--	--
Gas Station Fueling Hose Evaporative Standards ⁽¹⁾	--	1.4	--	--
Enhanced Vapor Recovery for Above Ground Storage Tanks ⁽¹⁾	--	NYQ	--	--
<u>Emission Reductions from Ground Support Equipment</u>	<u>0-1</u>	--	--	--
<u>Emission Reductions from Cargo Handling Equipment</u>	<u>0-1</u>	--	--	--
<u>Emission Reductions from Transport Refrigeration Units</u>	<u>0-1</u>	--	--	--
<u>Accelerated Turnover of Pleasure Craft</u>	<u>0-1</u>	--	--	--
AREAWIDE SOURCES/FUELS				
0-4	12.9			
CONSUMER PRODUCTS				
DPR 2008 Pesticide Plan		NYQ		
<u>Accelerated Use of Diesel Fuel Alternatives</u>	<u>0-4</u>			
Total Emission Reduction Potential from Proposed New Measures	122-193	46	9	20
Total Minimum Emission Reduction Commitment	163			

NYQ = Not Yet Quantified. BAR = Bureau of Automotive Repair. DPR = Department of Pesticide Regulation

Locomotive measure relies on U.S. EPA rulemaking and industry agreement to accelerate fleet turnover.

Note: Emission reductions reflect the combination impact of regulations and supportive incentive programs.

⁽¹⁾ These measures are not considered for SIP purposes since the source categories for these measures are not reflected in the baseline at this time.

TABLE 4-65B
2020 Expected Emission Reductions from CARB's Proposed New SIP Measures
(tons per day)

Proposed New SIP Measures	NOx	ROG	PM2.5	SOx
ON-ROAD SOURCES				
Passenger Vehicles	9.6-23.3	12.9-16.6	0.3	--
Smog Check Improvements (BAR)	8.3	8.7	0.2	--
Expanded Vehicle Retirement	1.3	1.2	0.06	--
Modifications to Reformulated Gasoline Program	<u>0-3.0</u>	3.0	--	--
<u>Accelerated penetration of ATPZEV's</u>	<u>0-5.4</u>	<u>0-2.4</u>		
<u>On-Board Diagnostics (III)</u>	<u>0-5.3</u>	<u>0-1.3</u>		
Trucks	26.9-33.9	2.6	1.5	--
Cleaner In-Use Heavy-Duty Trucks	26.9-33.9	2.6	1.5	--
GOODS MOVEMENT SOURCES				
Auxiliary Ship Engine Cold Ironing and Other Clean Technology	28.3	--	0.4	0.7
Cleaner Main Ship Engines and Fuel	32.3	--	3.1	25.4
Port Truck Modernization	8.0	--	0.3	--
Accelerated Introduction of Cleaner Line-Haul Locomotives*	<u>13.4-17.5</u>	1.8	0.3	--
Clean Up Existing Harbor Craft	5.1	<u>NYQ 0.5</u>	0.2	--
OFF-ROAD SOURCES				
OFF-ROAD EQUIPMENT	18.7-39.9	2.9-4.4	1.8-1.7	--
	13.2	2.1		
Cleaner In-Use Off-Road Equipment (over 25hp)	<u>18.7-39.9</u>	<u>2.9-4.4</u>	<u>1.8-1.7</u>	--
	13.2	2.1		
AGRICULTURAL EQUIPMENT	NYQ	NYQ	NYQ	0
OTHER OFF-ROAD SOURCES	1.6-17.4	17.9-33.2	--	--
		33.7		
New Emission Standards for Recreational Boats	1.6	12.8	--	--
Expanded Off-Road Recreational Vehicle Emission Standards	--	<u>5.1-2.4</u>	--	--
Portable Outboard Marine Tank Evaporative Standards(1)	--	2.9	--	--
Refueling Gasoline Storage Tank Evaporative Standards(1)	--	1.9	--	--
Gas Station Fueling Hose Evaporative Standards(1)	--	1.6	--	--
Enhanced Vapor Recovery for Above Ground Storage Tanks	--	NYQ	--	--
<u>Emission Reductions from Ground Support Equipment</u>	<u>0-0.6</u>	<u>0-0.3</u>		
<u>Emission Reductions from Cargo Handling Equipment</u>	<u>0-0.7</u>			
<u>Emission Reductions from Transport Refrigeration Units</u>	<u>0-4.9</u>			
<u>Accelerated Turnover of Pleasure Craft</u>	<u>0-9.6</u>	<u>0-15.0</u>		
AREAWIDE SOURCES/FUELS				
CONSUMER PRODUCTS PROGRAM	--	13.5	--	--
DPR 2008 Pesticide Plan				
<u>Accelerated Use of Diesel Fuel Alternatives</u>	<u>0-4.5</u>			
Total Emission Reductions from Proposed New Measures	144-210	52-73.49	8	26
	138			
Total Minimum Emission Reduction Commitment	187	69		

NYQ = Not Yet Quantified. BAR = Bureau of Automotive Repair. DPR = Department of Pesticide Regulation

* Locomotive measure relies on U.S. EPA rulemaking and industry agreement to accelerate fleet turnover.

Note: Emission reductions reflect the combination impact of regulations and supportive incentive programs.

⁽¹⁾ These measures are not considered for SIP purposes since the source categories for these measures are not reflected in the baseline at this time.

TABLE 4-65C
2023 Expected Emission Reductions from CARB's Proposed New SIP Measures
(tons per day)

Proposed New SIP Measures	South Coast	
	NOx	ROG
ON-ROAD SOURCES		
Passenger Vehicles	<u>7.1-19.0</u>	<u>10.5-13.8</u>
Smog Check Improvements (BAR)	6.9	7.5
Expanded Vehicle Retirement	0.2	0.5
Modifications to Reformulated Gasoline Program	<u>0-2.7</u>	2.5
Accelerated Penetration of ATPZEV's	<u>0-4.5</u>	<u>0-2.1</u>
On-Board Diagnostics (III)	<u>0-4.7</u>	<u>0-1.2</u>
Trucks	<u>18.3-23.3</u>	<u>1.7</u>
Cleaner In-Use Heavy-Duty Trucks	<u>18.3-23.3</u>	1.7
GOODS MOVEMENT SOURCES	<u>99.2-102.5</u>	<u>2.5</u>
Auxiliary Ship Engine Emission Reductions	30.8	--
Cleaner Main Ship Engines and Fuel	39.9	--
Port Truck Modernization	7.0	--
Accelerated Introduction of Cleaner Line-Haul Locomotives*	<u>15.6-18.9</u>	1.9
Clean Up Existing Harbor Craft	5.9	<u>NYQ 0.6</u>
OFF-ROAD SOURCES		
OFF-ROAD EQUIPMENT	<u>13.9-29.8 12.2</u>	<u>1.9-3.2 2.0</u>
Cleaner In-Use Off-Road Equipment (over 25hp)	<u>13.9-29.8 12.2</u>	<u>1.9-3.2 2.0</u>
AGRICULTURAL EQUIPMENT	NYQ	NYQ
OTHER OFF-ROAD SOURCESs	<u>2.4-18</u>	<u>24-36.9 42.9</u>
New Emission Standards for Recreational Boats	2.4	<u>17.6 17.7</u>
Expanded Off-Road Rec. Vehicle Emissions Standards	--	<u>6.4 3.4</u>
Portable Outboard Marine Tank Evaporative Standards(1)	--	<u>1.0 4.0</u>
Refueling Gas Storage Tank Evaporative Standards(1)	--	<u>1.2 2.1</u>
Gas Station Fueling Hose Evaporative Standards(1)	--	<u>1.5 1.7</u>
Above Ground Storage Tanks Enhanced Vapor Recovery	--	NYQ
<u>Emission Reductions from Ground Support Equipment</u>	<u>0-0.6</u>	<u>0-0.3</u>
<u>Emission Reductions from Cargo Handling Equipment</u>	<u>0-0.6</u>	--
<u>Emission Reductions from Transport Refrigeration Units</u>	<u>0-5.3</u>	--
<u>Accelerated Turnover of Pleasure Craft</u>	<u>0-9.1</u>	<u>0-12.6</u>
AREAWIDE SOURCES	<u>0-4.2</u>	<u>13.7</u>
CONSUMER PRODUCTS PROGRAM	--	13.7
DPR 2008 Pesticide Plan		<u>NYQ</u>
<u>Accelerated Use of Diesel Fuel Alternatives</u>	<u>0-4.2</u>	
Total Emission Reductions from Proposed New SIP Measures	<u>141-197 139</u>	<u>54-72 52</u>
Total Minimum Emission Reduction Commitment	<u>175</u>	<u>68</u>

NYQ = Not Yet Quantified. BAR = Bureau of Automotive Repair. DPR = Department of Pesticide regulation

* Locomotive measure relies on U.S. EPA rulemaking and industry agreement to accelerate fleet turnover.

Note: Emission reductions reflect the combination impact of regulations and supportive incentive programs.

(1) These measures are not considered for SIP purposes since the source categories for these measures are not reflected in the baseline at this time

DISTRICT STAFF'S PROPOSED POLICY OPTIONS TO SUPPLEMENT CARB'S CONTROL STRATEGY

Since the release of the Proposed Modifications to the Draft 2007 AQMP (including the proposed policy options presented in this section), discussions among three agencies (District, CARB, and SCAG) have progressed and the District staff's proposed control strategy has been modified as presented in the previous sections of this chapter. The following section is retained for informational purposes. The current proposed strategy relies on a combination of all three policy options. Implementation of these policy options will provide an overall 71 tons per day of NO_x reductions by 2014 at an overall cost of \$600 million per year over 6 years. The proposed options present a menu of feasible regulatory actions and incentive funding programs which could be implemented on by CARB to achieve the balance of reductions (i.e., 41 tons per day of NO_x by 2014) needed for PM_{2.5} attainment in 2015. As such, the corresponding level of public funding for achieving the 41 tons of reductions is estimated to be \$80 to \$290 million per year for 2009 to 2014 with public funding focused on economic hardships or early compliance.

Additional reductions in mobile source emissions beyond the reductions identified in CARB's revised draft mobile source control strategy are needed in order for the South Coast Air Basin to attain the federal PM_{2.5} ambient air quality standard by 2015. To achieve the necessary reductions poses several challenges. The most significant challenge is the short timeframe to achieve the necessary reductions. This challenge can be partially overcome with early actions to affect mobile source cleanup through voluntary incentive programs such as the Carl Moyer Program. However, additional public funds are needed to accelerate such efforts. Regulatory actions to mandate mobile source cleanup are also needed beyond those identified by CARB to date.

The District staff believes that a combination of regulatory actions and public funding is the most effective means of achieving emission reductions. As such, the 2007 Draft Final AQMP proposes three policy options for the decision makers to consider in achieving additional reductions. The first option is the District staff's proposed additional control measures as a menu of selections to further reduce emissions from sources primarily under State and federal jurisdiction. The proposed additional control measures represent a menu of measures that the State could implement and are intended to complement CARB's mobile source control strategy with defined short-term and mid-term control measures needed for reaching attainment by 2015 and to meet legal requirements.

The proposed additional control measures are also intended to highlight the level of stringency and reductions needed from State and federal sources for attainment. These measures can be modified or substitutes can be developed by the

implementing agencies to achieve equivalent or greater reductions in the time frame needed for PM_{2.5} attainment. The proposed rate of progress for NO_x under Policy Option 1 is shown in Figure 4-2. It should also be noted that full implementation of the proposed measures will result in significant reductions in air toxic contaminants.

The second option is to have the state fulfill its NO_x emission reduction obligations under 2003 AQMP by 2010 for its short-term defined control measures plus additional reductions needed to meet the NO_x emission target between 2010 and 2014. Under this option the state could include some of the proposed measures under the first option or other measures that the state identifies as part of the SIP public process. The rate of progress for NO_x under Policy Option 2 is also shown in Figure 4-2.

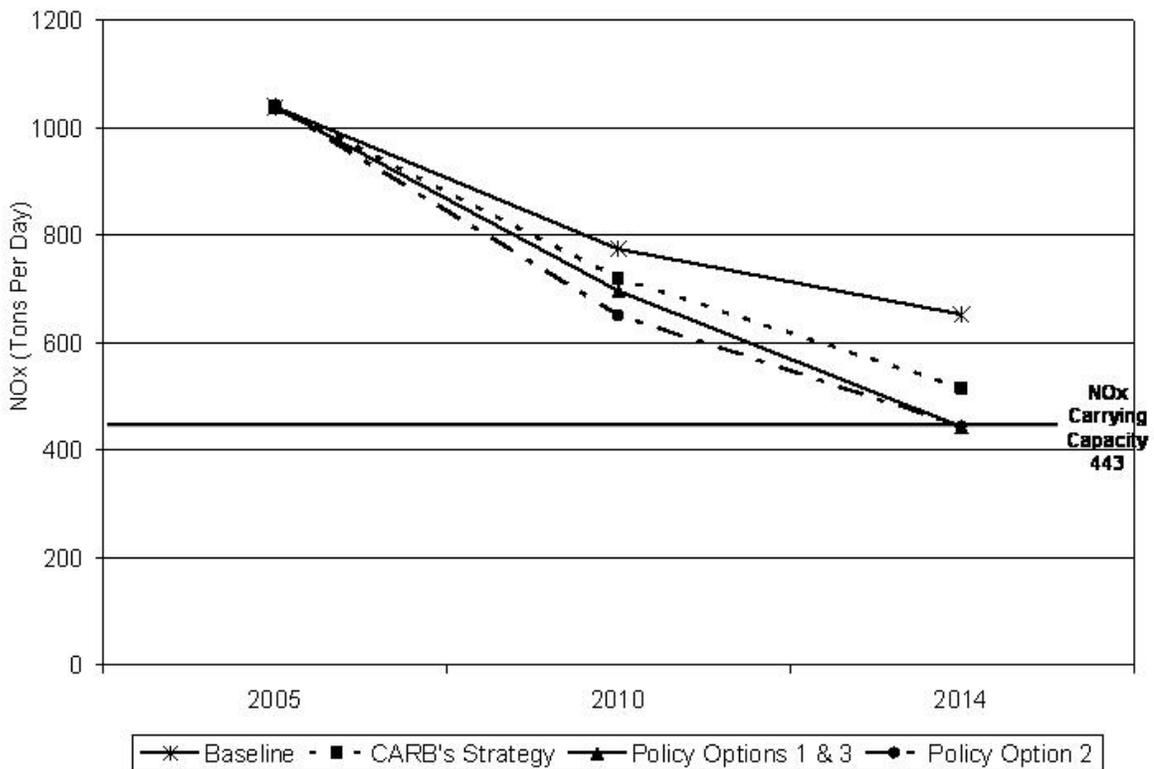


FIGURE 4-2

NO_x Rate-of-Progress for the Three Policy Options

The third option is based on the same rate of progress under Policy Option 1, but it relies heavily on public funding assistance to achieve the needed NO_x reductions via accelerated fleet turnover to post-2010 on-road emission standards or the cleanest off-road engine standards in effect today or after 2010. Under Policy Option 3,

CARB or the District would assume the responsibility of implementing the incentive programs based on specific funding designated for this purpose. Based on the analysis performed for the Carl Moyer program, up to an estimated \$600 million per year is needed between 2009 and 2014. Table 4-76 illustrates possible funding sources that have been suggested in the past by various parties and the District staff has included these as a matter of perspective and is seeking comments and suggestions on appropriate funding sources.

TABLE 4-76

Example List of Past Suggested Funding Sources by Various Parties*

Potential Funding Sources	Potential Funding Levels
Carl Moyer Program	~\$35 - \$50 million/yr
MSRC Program	~ \$8 - \$10 million/yr
Marine Ports User Fee Proposals	~\$250 million/yr
1-cent Increase in Fuel Tax	~\$70 - \$80 million/yr

* Sources listed in Table 4-6 are provided for discussion purposes only.

The District staff recognizes these are very difficult policy choices the Basin is facing, but not meeting the PM_{2.5} standard by 2015 is not an acceptable public policy in light of recent health studies on particulate matter, not to mention the potential adverse economic impacts on the region due to potential federal sanctions. The following sections further describe the three policy options.

Policy Option 1

Table 4-87 provides a list of the proposed additional control measures for on-road and off-road mobile sources with estimated reductions in 2014 and 2023 for CARB's consideration under this option. Based on CARB's proposed mobile source control strategy, District staff refined its evaluation of the control measures recommended in the Draft AQMP. Depending on the mobile source sector and the proposed control approach, District staff analyzed the need to accelerate the penetration of cleaner engine technologies. The control measures proposed in Table 4-86 represent strategies that are technologically feasible. However, implementation challenges such as cost and need to implement as soon as possible must be overcome. For goods movement source categories such as marine vessels, trucks, rail, and cargo handling equipment, the control measures proposed by the District are primarily based on a hybrid approach that relies on measures and strategies outlined in CARB's Goods Movement Emissions Reduction Plan and the adopted San Pedro Bay Ports Clean Air Action Plan. However, where warranted, a number of measures

from these plans have been revised to reflect a higher level of stringency or fleet penetration in order to achieve the necessary reductions for attainment. Detailed descriptions of these control measures are provided in the ~~Proposed Modifications to the Draft~~ Final 2007 AQMP, Appendix IV-B-2.

TABLE 4-87

Additional Mobile Source Control Measures Proposed by the District

Control Measure Number	Title	Estimated Reductions (t/d)	
		2014	2023
SCONRD-01	Accelerated Penetration of Advanced Technology Partial Zero-Emission and Zero Emission Vehicles	VOC: 0.4 NOx: 0.9 PM2.5: 0.04	VOC: 2.1 NOx: 4.5 PM2.5: 0.4
SCONRD-02	Deployment of On-Board Diagnostics (Phase III) in Light- and Medium-Duty Vehicles	VOC: 0.4 NOx: 2.9	VOC: 1.2 NOx: 4.7
SCONRD-03	Further Emission Reductions from On-Road Heavy-Duty Vehicles	VOC: NOx: 20.9 PM2.5: 1.2	VOC: NOx: 5.0 PM2.5: 0.2
SCONRD-04	Further Emission Reductions from Heavy-Duty Trucks Providing Freight Drayage Services	NOx: 6.3 PM2.5: 0.02	NOx: 0.0 PM2.5: 0.0
SCOFFRD-01	Construction/Industrial Equipment Fleet Modernization	VOC: 3.0 NOx: 15.8	VOC: 1.3 NOx: 15.9
SCOFFRD-02	Further Emission Reductions from Cargo Handling Equipment	NOx: 1.1 PM2.5: 0.02	NOx: 0.6 PM2.5: 0.01
SCOFFRD-03	Further Emission Reductions from Locomotives	NOx: 11.0 PM2.5: 0.4	NOx: 3.3 PM2.5: 0.1
SCOFFRD-04	Emission Reductions from Airport Ground Support Equipment	VOC: 0.3 NOx: 0.8	VOC: 0.3 NOx: 0.6
SCOFFRD-05	Emission Reductions from Transport Refrigeration Units	NOx: 1.1	NOx: 5.3
SCOFFRD-06	Accelerated Turnover and Catalyst-Based Standards for Pleasure Craft	VOC: 2.9 NOx: 1.0 PM2.5: 0.6	VOC: 12.6 NOx: 9.1 PM2.5: 4.0
SCFUEL-01	Further Emission Reductions from Gasoline Fuels	NOx: 5.2 SOx: 1.4	NOx: 2.7 SOx: 1.5
SCFUEL-02	Further Emission Reductions from Diesel Fuels	NOx: 3.9 SOx: 0.05 PM2.5: 0.2	NOx: 4.2 SOx: 0.1 PM2.5: 0.2
Total		VOC: 7.0 NOx: 70.9 SOx: 1.4 PM2.5: 2.6	VOC: 17.3 NOx: 55.7 SOx: 1.6 PM2.5: 4.9

The recommended mobile source control measures focus on aggressive accelerated turnover of older, existing vehicles with the cleanest engines commercially available. This would require the commercial availability of on-road advanced technology

partial zero emissions vehicles (ATPZEV) such as plug-in hybrids or cleaner vehicles in the light- and medium-duty sector and heavy-duty vehicles that meet future exhaust emission standards. Several automobile manufacturers are producing gasoline hybrid electric vehicles that meet the PZEV levels. Some of the newer models meet the cleanest PZEV level (commonly termed, advanced technology PZEV or ATPZEV). Control Measure SCONRD-01 calls for accelerated sales of about 100,000 new plug-in hybrid vehicles that meet the ATPZEV by 2014 and additional 900,000 vehicles by 2020. Based on the estimated annual sales of about 600,000 new vehicles per year, District staff believes that if such a program is implemented, the proposed replacement could occur. Relative to heavy-duty vehicles, Control Measure SCONRD-03 target an additional 15 percent of the oldest, pre-2010 heavy-duty vehicles (about 21,000 older existing heavy-duty diesel vehicles) be replaced with new vehicles or retrofitted with after-treatment control devices meeting 2010 exhaust emission standards. This would be in addition to CARB's proposed control strategy for on-road heavy-duty vehicles, which is envisioned to affect about 38,000 heavy-duty vehicles. There are about 190,000 heavy-duty vehicles estimated to be operating in the South Coast Basin in 2014. The accelerated replacement program would seek essentially a replacement of 30 percent of the total fleet with the cleanest commercially available vehicles.

For the off-road mobile source sector, proposed additional control measures call for the replacement of these mostly uncontrolled emissions with newer, cleaner models. Control Measure SCOFFRD-01 proposes that older construction and industrial equipment be replaced or repowered with the cleanest available engines through more stringent NO_x fleet average requirements than those proposed by CARB. Control Measure SCOFFRD-04 calls for accelerated replacement of airport ground support equipment with electric models to, at a minimum, meet the emission reductions provided in the Memorandum of Understanding that was terminated by the Air Transport Association in 2006. Also, a large number of pleasure craft are powered by older two-stroke engines. As such, Control Measures SCOFFRD-06 would seek accelerated replacement of older two stroke engines that emit higher levels of VOC, NO_x, and PM.

In addition to accelerated fleet turnover, several of the measures recommend accelerated retrofits of vehicle and equipment with after-treatment control devices to further reduce NO_x and PM emissions. Specifically, Control Measure SCONRD-03 seeks for post-2007 to 2009 on-road heavy-duty vehicles to be retrofitted with control devices to reduce NO_x emissions by at least 30 percent. Control Measure SCOFFRD-05 calls for similar emission benefits through an accelerated replacement or retrofit programs for truck refrigeration units.

Relative to goods movement related sources, Control Measures SCOFFRD-02 – cargo handling equipment and SCOFFRD-03 – locomotives, seek accelerated

replacement and retrofitting of existing engines and equipment consistent with the measures provided in the adopted San Pedro Bay Ports Clean Air Action Plan and CARB's Goods Movement Emissions Reduction Plan. Other goods movement related measures called for in the San Pedro Bay Ports Clean Air Action Plan are covered in CARB's proposed control strategy. However, relative to on-road trucks providing drayage services to the marine ports, SCONRD-04 is included to reflect the implementation of the heavy-duty truck measure provided in the adopted San Pedro Bay Ports Clean Air Action Plan.

In addition to proposed additional reduction from on-road and off-road mobile sources, two measures are proposed for lower sulfur content gasoline fuels and greater use of diesel fuel alternatives, which will provide additional NO_x emission reduction benefits as well as lower sulfur emissions.

Furthermore, the proposed additional control measures include three long-term measures to be implemented after 2015, which call for additional NO_x emission reductions in the on-road and off-road mobile sectors and VOC reductions from consumer products. The long-term strategies include cleaner gasoline and diesel fuels, greater use of diesel fuel alternatives, expanded modernization programs for heavy-duty vehicles, off-road equipment, marine vessels, advanced cargo transportation systems, and additional reductions from aircraft.

The District staff's proposed additional mobile source control measures are estimated to achieve 7 tons per day of VOC, 70.9 tons per day of NO_x, 1.4 tons per day of SO_x, and 2.6 tons per day of PM_{2.5} emission reductions in 2014. In 2023, the estimated reductions for these measures are 17.3 tons per day of VOC, 55.7 tons per day of NO_x, 1.6 tons per day of SO_x, and 4.9 tons per day of PM_{2.5} emissions.

The following text provides a brief description of the proposed additional mobile source control measures:

SCONRD-01 – ACCELERATED PENETRATION OF ADVANCED TECHNOLOGY PARTIAL ZERO-EMISSION AND ZERO-EMISSION VEHICLES: This proposed control measure focuses on the accelerated penetration and implementation of advanced technologies that are capable of achieving partial zero-tailpipe emissions. CARB through its fleet averaging requirements under the current Low Emission Vehicle II program can ensure the availability of advanced technology partial zero-emission vehicles (ATPZEVs) in the California market. This proposed measure would require new sales of ATPZEVs such as plug-in hybrids or cleaner vehicles beginning in 2011 such that there will be about 100,000 new vehicles operating by 2014 and a total of 1 million operating by 2020. This proposal is consistent with the Governor's recent announcement to have 7 million alternative fueled or hybrids on the road by 2020.

SCONRD-02 – DEPLOYMENT OF ON-BOARD DIAGNOSTICS (PHASE III) IN LIGHT- AND MEDIUM-DUTY VEHICLES: This measure calls for the deployment of Phase III on-board diagnostics (OBD-III) in new vehicles beginning in 2011 and a program to retrofit existing vehicles with OBD-III. OBD-III has enhanced capabilities to monitor vehicle emissions and implementation of such device would eliminate the need for periodic smog check programs.

SCONRD-03 – FURTHER EMISSION REDUCTIONS FROM ON-ROAD HEAVY-DUTY VEHICLES: This measure calls for accelerated replacement of on-road heavy-duty vehicles with vehicles meeting the 2010 on-road heavy-duty exhaust emissions standards, beginning in 2011. The proposal calls for resources to be directed at cleaning up the 6 older “captive” fleet used for short to medium distance hauling that are not covered in CARB’s control strategy for on-road heavy-duty vehicles. This measure covers all heavy-duty vehicles except for Class 8 over-the-road trucks that provide freight drayage services at marine ports. This measure would target approximately 21,000 heavy-duty diesel vehicles, between 2001 through 2005 model-year for retrofitting or replacement by CY 2014 to meet 2010 on-road emission standards. An alternative implementation option could focus on retrofit/replacement programs targeting model years 2001 through 2009 heavy-duty vehicles. By 2014, a majority of these vehicles will be approaching the end of their useful lives and would be replaced with vehicles meeting 2010 on-road emission standards. Other vehicles would meet retrofit requirements, which would include at a minimum, a 30 percent reduction in NOx and at least an 85 percent reduction in particulate matter, depending on the model year of the vehicle.

SCONRD-04 – FURTHER EMISSIONS REDUCTIONS FROM HEAVY-DUTY TRUCKS PROVIDING FREIGHT DRAYAGE SERVICES: This measure calls for the retrofit or replacement of existing over-the-road trucks providing drayage services at marine ports, intermodal facilities, or warehouse distribution centers consist with the program provided in the adopted San Pedro Bay Ports Clean Air Action Plan. The state is currently developing a regulation on trucks operating at marine ports and intermodal facilities. However, the state’s proposal would be implemented over a 10 to 12 year period. The San Pedro Bay Ports Clean Air Action Plan calls for all trucks calling at the marine ports to be cleaned up by the end of 2011. As such, the proposed control measure would complement statewide actions and the emissions reductions associated with this measure would be beyond the reductions sought by CARB.

SCOFFRD-01 – CONSTRUCTION/INDUSTRIAL EQUIPMENT FLEET MODERNIZATION: Over the last ten years and over the next seven years, new off-road diesel engines will have met or will need to meet more stringent emissions standards. These standards are designated by different tiers with Tier 0 (uncontrolled) and older engines being the most polluting through Tier 4 engines which will be the cleanest off-road engines with emission standards somewhat higher than those for similarly aged on-road engines. CARB is proposing regulatory actions on this sector, which when implemented by 2014 will result in about 15 tons per day of oxides of nitrogen emissions reductions.

After discussions with CARB staff, the District staff believes that additional NO_x emission reductions could be achieved if CARB staff's proposed NO_x fleet average requirements were accelerated. The more stringent fleet average requirements would require that Tier 1 equipment be replaced or retrofitted to meet Tier 3 standards in addition to the uncontrolled (Tier 0) engines that would be covered by the proposed regulations. In addition, after the 2015 timeframe, Tier 2 and Tier 3 engines are proposed to be retrofitted with verified diesel emission control (VDEC) equipment that reduces their diesel PM emissions by 85% and meet Tier 4 NO_x levels. By 2020, it is further assumed that certain pre Tier 4 engines are replaced or retrofitted to meet the 2010 on-road emissions standards or better.

SCOFFRD-02 – FURTHER EMISSION REDUCTIONS FROM CARGO HANDLING EQUIPMENT: This control measure seeks additional emission reductions from cargo handling equipment beyond the state regulation. This measure would implement the proposed San Pedro Bay Ports Clean Air Action Plan beyond the five year horizon of the Clean Air Action Plan. The Plan calls for accelerated turnover of existing equipment with engines that meet 2007 or 2010 on-road emissions standards or Tier 4 off-road emissions standards by 2014. This measure could be implemented through further state regulatory actions or the marine ports' authority over its tenants.

SCOFFRD-03 – FURTHER EMISSION REDUCTIONS FROM LOCOMOTIVES: This measure calls for all locomotives operating in the Basin to meet Tier 3 equivalent emissions by 2014. In addition, the measure proposes that all locomotives moving in and out of the twin ports in the Southern California region to be equipped with Tier 3-equivalent controls by 2011. Existing technologies can reduce oxides of nitrogen and particulate matter emissions by over 90 percent.

SCOFFRD-04 – EMISSION REDUCTIONS FROM AIRPORT GROUND SUPPORT EQUIPMENT: This measure would seek emission reductions from airport ground support equipment through additional electrification originally provided in the MOU terminated by the Air Transport Association. In addition,

equipment that could not be electrified would be required to use cleaner fuels or be repowered to meet a more stringent fleet average emissions rate.

SCOFFRD-05 – EMISSION REDUCTIONS FROM TRANSPORT REFRIGERATION UNITS: This measure calls for the development of regulations to reduce NOx emissions from truck refrigeration units based on replacement with electric units or retrofits. CARB could development new retrofit or replacement requirements to accelerate NOx reductions. In addition, incentives could be provided to increase fleet turnover prior to regulatory actions.

SCOFFRD-06 – ACCELERATED TURNOVER AND CATALYST BASED STANDARDS FOR PLEASURE CRAFT: This measure proposes to accelerate the turnover of outboard engines, personal watercraft, and inboard/sterndrive boats to ensure that by 2014 that the outboard engines and personal watercraft fleet average meets Tier 3 standard levels (the most stringent levels in place today), and the inboard/sterndrive fleet average meets 2008 standard levels (the cleanest levels currently promulgated). By 2020, CARB is proposing new emission standards for outboard engines and personal watercraft, which by 2020 will have fleet average emission levels approximately three times more stringent than the 2014 levels. This control measure calls for accelerated turnover prior to regulatory mandates. In the 2015 to 2020 timeframe, this measure calls for new inboard/sterndrive fleet average emission standards approximately 10 times more stringent than the 2014 levels. In addition, it is proposed that incentives be provided to accelerate turnover prior to implementation of the new standards.

SCFUEL-01 – FURTHER EMISSION REDUCTIONS FROM GASOLINE FUELS: This measure would seek a maximum sulfur content for gasoline fuels to be set at 10 ppm compared to the current maximum of 30 ppm. This would result in a 67 percent reduction in direct sulfur emissions and somewhat lower oxides of nitrogen emissions.

SCFUEL-02 – FURTHER EMISSION REDUCTIONS FROM DIESEL FUELS: This measure seek greater use of diesel fuel alternatives such as alternative fuels, gas-to-liquid fuels, dimethyl ether, or other cleaner diesel blends. Emission reduction benefits for oxides of nitrogen, sulfur oxides, and directly emitted particulate matter could result with the use of diesel fuel alternatives. This measure calls for 10 percent of the current diesel fuel be replaced with diesel fuel alternatives by 2014.

Policy Option 2

Under this option the state would fulfill its NOx emission reduction obligations under the 2003 AQMP by 2010. An additional 208 tons per day would be needed to meet

the NO_x emission target between 2010 and 2014. Under this option the state could include some of the proposed measures under the first option or other measures that the state identifies as part of the SIP public process. The rate of progress for NO_x under Policy Option 2 is shown in Figure 4-2.

As shown in Figure 4-2, the projected 2010 base year emissions for NO_x is estimated to be at 775 tons/day. When the state submitted the 2003 AQMP to the U.S. EPA, the State provided as its obligation to reduce NO_x emissions by 156 tons/day in order to meet the 1-hour ozone ambient air quality standard by 2010. Based on the state's actions since the submittal of the 2003 AQMP, 32 tons/day of NO_x emission reductions have been achieved, leaving another 124 tons/day to be achieved by 2010. After 2010, an additional 208 tons/days of NO_x emission reductions are needed to meet the federal PM_{2.5} ambient air quality standard by 2014.

The state may choose to meet the 2010 obligation through a combination of the remaining commitments under 2003 AQMP (shown in Table 1-3 of this document), its proposed control strategy plus the measures provided under Option 1 or any other measures the state may identify. In addition, the state would need to identify additional reductions to be implemented by 2014 to meet the NO_x emissions reduction levels needed to attain the federal PM_{2.5} ambient air quality standard. Again, this can be any set of measures the state identifies for this option, which could be a combination of its proposed control strategy, measures identified under Option 1, or any other measure not identified at this time.

Policy Option 3

The third option is based on the same rate of progress under Policy Option 1, but relies heavily on public funding assistance to achieve the needed NO_x reductions via accelerated fleet turnover to post-2010 on-road emission standards or the cleanest off-road engine standards in effect today or after 2010. This would include funding for the replacement of on-road heavy-duty vehicles, off-road mobile equipment, pleasure craft, and off-road vehicles.

Under Policy Option 3, CARB and the District would assume the responsibility of implementing the incentive programs based on specific funding levels designated for this purpose. Based on the analysis performed for the Carl Moyer program, up to an estimated \$600 million per year is needed between 2009 and 2014. In addition, significant funding would be made available beginning in mid-2008 through 2014. The total public funding estimated to achieve the additional NO_x emission reductions of 70 tons/day as identified in Table ~~4-8~~ ~~2-11~~, is about \$3 billion based on the current Carl Moyer Program cost-effectiveness criteria of \$14,300/ton with a 10-year project life. This is a conservative estimate since many of the projects would be more cost-effective than the \$14,300/ton criteria.

The total public funding needed of about \$600 million per year would need to begin in mid-2008. Currently, the District receives about \$55 million per year, which a significant portion has been allocated by the District Governing Board to accelerate vehicle turnover. In addition, the Mobile Source Emissions Reduction Review Committee (MSRC) allocates a significant amount of funds to cleaner vehicles. The MSRC is currently allocating funding assistance for on-road engines meeting 2010 emissions standards and replacement of off-road equipment with current commercially available Tier 3 engines. In order to implement this option, additional funding must be identified within the next year and a half. Funding proposals such as user fees, surplus fuel tax, or other mechanisms such as port tariff fees (which would facilitate cleanup of goods movement related sources) are examples of funds that could be made available to cover the implementation of this option.

Relative to total emission reductions, each policy option would reach the same NOx emissions levels as identified in the PM2.5 attainment demonstration (i.e., 443 tons/day of remaining NOx emissions). CARB has identified 125 tons/day of NOx emission reductions from its proposed control strategy. An additional 70 tons/day of NOx emission reductions would be needed to demonstrate attainment. As such, all three policy options would achieve the additional 70 tons/day of reductions, but through different implementation mechanisms and on different implementation schedules. Appendix IV-B-2 provides more specific descriptions of the three mobile source control options.

LONG-TERM CONTROL STRATEGY [(182)(E)(5) MEASURES OR "BLACK BOX"]

In order to demonstrate attainment of the 8-hour ozone standard, long-term emission reductions above and beyond those achieved from short-term and mid-term measures by the District, CARB, and SCAG are required by 2023. Although the PM2.5 strategy would provide continuous progress in improving the ozone air quality, additional long-term VOC and NOx reductions are needed for full ozone attainment. Based on the District's recent modeling analysis (described in Chapter 5) which incorporates the latest revisions to the mobile source inventory, a NOx-heavy control approach supplemented with additional VOC reductions will be the most effective ozone attainment strategy for this region. By 2023, mobile sources would account for over 90% of NOx emissions in the Basin. Therefore, the long-term strategy for this Plan primarily focuses on reductions from mobile sources. Long-term reductions are primarily based on long-term measures that anticipate the development of new control techniques or improvement of existing control technologies. The federal Clean Air Act (CAA) Section 182(e)(5) specifically authorizes the inclusion of such long-term measures for extreme ozone nonattainment areas – these measures are often referred to as the “black box.” The size of the black box is based on the

difference between the final attainment target (carrying capacity) for each pollutant and the emissions remaining after the implementation of short-term and mid-term control measures.

Although the South Coast Air Basin is classified as a “severe-17” non-attainment area for the 8-hour ozone standard with an attainment date of 2021, the federal regulation allows such regions to request for a bump up to “extreme” classifications in order to be able to rely on 182(e)(5) measures for demonstrating attainment. The District is proposing to exercise this option because of the magnitude of additional reductions required for attainment not achievable through existing pollution control approaches. The new attainment date under the “extreme” classification will be 2024 with necessary reductions achieved by 2023.

Achieving the reductions ascribed to the black box by the 2024 attainment deadline will pose a tremendous challenge to the agencies, businesses, and residents of California. Based on the latest emission inventory and modeling analysis, the overall reduction targets for meeting the 8-hour ozone standard are 116 tons per day of VOC and 383 tons per day of NO_x in 2023 (i.e., from 2023 projected baseline). The ~~Proposed Modifications to the Draft~~ Final 2007 AQMP’s long-term strategy builds upon the long-term reductions associated with the implementation of short- and mid-term control measures or actions proposed by the District, SCAG, and CARB. For achieving the remainder of reductions needed for attainment, the long-term strategy primarily relies on long-term control measures based on new advanced technologies and control techniques or significant improvement of existing technologies which cannot be specifically defined at this time (i.e., “black box”). After implementation of the short-term and mid-term control measures, the size of the black box is estimated to be ~~2928~~ tons per day of VOC and ~~188179~~ tons per of NO_x reductions in 2023, representing ~~43%~~41% of the overall combined VOC and NO_x reductions needed for ozone attainment..

The following table provides a list of some of the advanced technologies and innovative control approaches which could be relied upon to achieve the long-term reductions needed for ozone attainment highlighting the level of stringency and aggressiveness of controls required.

TABLE 4-98
Possible Approaches for Long-Term Control Measures

Light Duty Vehicles	<ul style="list-style-type: none"> ▪ Extensive retirement of high-emitting vehicles and accelerated penetration of PZEVs and ZEVs
On-Road Heavy Duty Vehicles	<ul style="list-style-type: none"> ▪ Expanded modernization and retrofit of heavy-duty trucks and buses ▪ Expanded inspection and maintenance program ▪ Advanced near-zero and zero-emitting cargo transportation technologies
Off-Road Vehicles	<ul style="list-style-type: none"> ▪ Expanded modernization and retrofit of off-road equipment
Fuels	<ul style="list-style-type: none"> ▪ More stringent gasoline and diesel specifications; Extensive use of diesel alternatives
Marine Vessels	<ul style="list-style-type: none"> ▪ More stringent emission standards and programs for new and existing ocean-going vessels and harbor craft
Locomotives	<ul style="list-style-type: none"> ▪ Advanced near-zero and zero emitting cargo transportation technologies
Pleasure Craft	<ul style="list-style-type: none"> ▪ Accelerated replacement and retrofit of high-emitting engines
Aircraft	<ul style="list-style-type: none"> ▪ More stringent emission standards for jet aircraft (engine standards, clean fuels, retrofit controls); <u>Airport Bubble</u>
Consumer Products	<ul style="list-style-type: none"> ▪ Ultra Low-VOC formulations; Reactivity-based controls
Renewable Energy	<ul style="list-style-type: none"> ▪ Accelerated use of renewable energy and development of hydrogen technology and infrastructure
AB32 Implementation	<ul style="list-style-type: none"> ▪ Concurrent criteria pollutant reduction technologies

These control approaches are presented under four long-term control measures which are briefly described here. More detailed descriptions of these measures are provided in Appendix IV-B-2.

SCLTM-01A – FURTHER REDUCTIONS FROM ON-ROAD MOBILE SOURCES: This control measure proposes to achieve further NO_x reductions from on-road mobile source categories beyond the reductions achieved from the short-term measures through 1) accelerated turn-over of high-emitting vehicles and penetration of ATPZEVs and ZEVs; and 2) expanded modernization of heavy-duty vehicles through replacements or retrofits; 3) fuel reformulations and use of diesel fuel alternatives; and 4) advanced near-zero, and zero emitting cargo transportation technologies.

SCLTM-01B – FURTHER EMISSION REDUCTIONS FROM ON-ROAD HEAVY-DUTY VEHICLES: This control measure proposes the development of an expanded inspection and maintenance (I/M) program for heavy-duty diesel trucks by 2015. Specifically, the current smoke inspection program should be expanded to

include (1) a visual under-the-hood inspection of the emission control devices, (2) an electronic check of the truck's on-board computer, and (3) use of remote sensing technology to assess in-use heavy-duty diesel truck emissions.

SCLTM-02 – FURTHER REDUCTIONS FROM OFF-ROAD MOBILE SOURCES: This control measure proposes to achieve further NO_x reductions from various off-road mobile source categories beyond the reductions achieved from the short-term measures through 1) accelerated turn-over of existing equipment and vehicles and replacement with new equipment meeting the new engine standards; 2) retrofit of existing vehicles and equipment with add-on controls such as SCR; and 3) new engine standards (e.g., aircraft, ships). Based on the comments received during the AQMP review process, the airport bubble concept was identified as a potential control strategy which will be evaluated under this long-term control measure.

SCLTM-03 – FURTHER REDUCTIONS FROM CONSUMER PRODUCTS: After implementation of adopted regulations and the short-term measure, consumer products category would remain the largest VOC category in the Basin at 88 tons per day in 2023. This measure proposes to implement low-VOC technologies developed for stationary sources into categories with similar uses in consumer products. In addition, the use of lower reactive VOC compounds could offer the potential for achieving equivalent reductions.

In addition to the proposed long term measures described above, reductions from the following programs can be used to fulfill, in part, the “black-box” commitment:

- NSR: Any excess reductions from the NSR program due to BACT or offset ratio beyond the AQMP assumptions; and
- District's short-term measures: Any emission reductions achieved from these measures that are beyond the District's SIP commitment will be used to offset CARB's “black-box” commitment. Furthermore, permanent reductions in emission estimates due to improvement in inventory methodology are SIP creditable if the changes are approved by the District Governing Board at its regularly scheduled public meetings.

Under AB32, the State has established a goal of reducing the greenhouse gas (GHG) emissions to 1990 levels by 2020 through an enforceable statewide emissions cap which will be phased in starting in 2012. AB32 directs CARB to establish a mandatory reporting and tracking system, update the emissions inventory, and develop appropriate regulations to achieve maximum technologically feasible and cost-effective emission reductions in meeting the GHG reduction target in 2020. Strategies underway or being considered include, but are not limited to vehicle

climate change standards, accelerated renewable portfolio standard, energy efficiency programs and standards, and recycling programs among others.

The Renewable Portfolio Standard (RPS), established in 2002, requires that all load serving entities achieve a goal of 20% of retail electricity sales from renewable energy sources by 2017. The Governor has increased this goal to 33% renewable which was adopted by CPUC and CEC in 2005 as described in the 2005 Energy Action Plan II. The two agencies have already commenced review of the legal, regulatory, and infrastructure changes necessary to achieve the Governor's goal. It is estimated that this measure would result in 11 million tons CO₂ equivalent emission reductions by 2020. This measure not only reduces power plant emissions, but also provides a clean energy source to support other control strategies (e.g., plug-in hybrid vehicles). Concurrent reductions in criteria pollutants associated with the implementation of these measures will be credited towards the AQMP's long-term reduction commitments. The recently-adopted energy penetration targets could be viewed as highly challenging, and yet, they present unique opportunities in reshaping many aspects of our economy including power generation, transportation just to name a couple. To that end, the District is committed will work collaboratively with the responsible agencies to facilitate the implementation of GHG measures and maximize their benefits in this region (e.g., funding mechanisms).

In addition, in order to achieve the long-term emission reduction commitments, several mechanisms will be used by District staff to identify and implement new control strategies. These mechanisms described below include, but are not limited to: 1) Annual Technology Assessment Workshops; 2) Emissions Inventory Updates/Studies; 3) VOC Reactivity Studies; 4) Periodic BACT Evaluations, and 5) Collaboration with State Agencies on Concurrent Reductions. In addition to these mechanisms, advanced control technologies (mobile and stationary sources) and innovative control approaches (e.g., market incentive programs, localized controls), presented later in this Chapter, are also expected to play a major role in achieving the long-term reductions required for demonstrating attainment with the federal 8-hour ozone standard. A brief description of the above mechanisms is provided here:

(1) Annual Technology Assessment Workshops

The District will conduct annual technology assessment workshops with participation from a broader audience including consultants, technical experts, and other interested parties to identify the latest technology improvements and process changes which could lead to implementation of cost-effectiveness control strategies to further reduce NO_x and VOC emissions. Potential control methods will include, but are not limited to near-zero or zero-VOC coating and solvent formulations and technologies (e.g., water-based, ultraviolet/electrobeam curing technologies, powder coatings), add-on controls, improved inspections and maintenance programs, and process

modifications. Manufacturing processes identified through the enforcement of stationary source rules such as Rule 442 – Usage of Solvents, will also be used to identify potential control strategies.

(2) Emissions Inventory Updates/Studies

As part of the effort in identifying new source categories for potential controls, specific emission studies will be conducted to refine emission inventories. Any emission studies conducted that resulted in permanent emission reductions (relative to 2007 AQMP inventory) due to changes in inventory methodology or emission factor update, will be credited toward the District's SIP commitment for long-term measures. These changes will be approved by the District's AQMD-Governing Board at a public meeting to allow public review and comments. Also, studies conducted as part of implementing the Annual Emissions Reporting (AER) Program (i.e., reviewing/auditing AER filings from large facilities) will be used to identify any new emission reduction strategies voluntarily implemented by facilities (for reducing annual emission fees) which may exceed the limits under the District's existing regulations.

(3) VOC Reactivity Studies

Studies conducted to evaluate the reactivity of VOC compounds will lend support to the possibility of using low-reactivity-based products for incorporation into future rule development for further VOC reductions.

(4) Periodic BACT Evaluations

BACT evaluations will be conducted periodically to identify new control strategies that may result from add-on controls or process changes for existing sources.

(5) Collaboration with State Agencies on Concurrent Reductions

The District will work closely with State agencies responsible for implementing global warming strategies (i.e., CARB, California Energy Commission, Public Utilities Commission) to quantify concurrent emissions reductions of criteria pollutants associated with strategies for stationary and mobile sources.

New control measures identified through any of the above five mechanisms will be reported to the Governing Board in December of every year, as part of the District's Annual Rule and Control Measure Forecast Report. This report will also provide a preliminary estimate of the expected emission reductions from each newly identified measure along with the proposed rule adoption calendar. Furthermore, in January of each year, District staff will provide a summary of the emission reductions achieved

through adoption of the control measures by the Governing Board in the previous year(s) to track the performance of its SIP commitment.

The District is committed to continue actively seeking cost-effective and technically feasible control measures. Once these measures are identified, they will be adopted and implemented as early as practicable while meeting all public notification requirements. The reductions achieved in aggregate would then be used first to satisfy the District's short-term commitment, if there is a shortfall – otherwise, the District's long-term SIP commitment. Any excess reductions achieved would be contributed to the State/federal long-term reduction goals. However, it bears repeating that all source categories should produce their fair share of cost-effective emission reductions.

Advanced Technologies

The proposed attainment strategy will require an aggressive development and commercialization of advanced mobile and stationary source control technologies. In addition, significant use of new and advanced technologies into in-use applications is critical if the additional reductions are to be realized by 2023.

Some of the advanced technologies and innovative control approaches which may be relied on to achieve the additional emission reductions, needed for attainment demonstration, are briefly described below.

Fuel Cells

Fuel cells are electrochemical devices that convert hydrogen and oxygen directly into electricity and water with little or no pollutant emissions. Most fuel cell systems use ambient air as the oxygen source, and the hydrogen fuel is either provided directly to the fuel cell or produced first from a fossil fuel (e.g. natural gas or methanol). The process of producing hydrogen from a fossil fuel is termed “reforming” and can be done external to the fuel cell or internally within the stack, such as with the high temperature molten carbonate fuel cells. Fuel cells are similar to batteries in that both offer zero or near-zero emissions, high efficiency, responsive power, few moving parts, and low noise. A battery, however, is an energy storage device and can only provide power until its reservoir of stored chemical reactants is spent, at which point it must be recharged. Fuel cells, on the other hand, are energy conversion devices which can provide power as long as the fuel and oxidant are provided. Although fuel cells have been around for decades, the major hurdles affecting their commercialization are their high (but improving) cost of production, fueling infrastructure (for mobile applications), and reliability and durability.

The U.S. Department of Energy (DOE) adopted the Freedom Car Program in January 2002 to accelerate the introduction and commercialization of fuel cell vehicles. Additionally, the District's Technology Advancement Office program has played a leading role toward addressing these issues and expediting the commercialization of fuel cells for both mobile and stationary applications. For example, the District is contributing resources to support both the California Fuel Cell Partnership ("Partnership") and the California Stationary Fuel Cell Collaborative ("Collaborative"). The goals of both statewide initiatives are to advance the deployment and commercialization of fuel cell technologies for clean air and efficiency benefits engendered by the technology. Both the Partnership and the Collaborative seek to form alliances between government agencies and industry to the benefit of California residents. The District has also participated in the development of the California Hydrogen Network Blueprint Plan and continues to provide input as the plan is being implemented. This coordinated effort has resulted in OEM announcements of deploying hundreds of fuel cell vehicles by 2010.

In addition, the District has been proactive in establishing demonstration projects for the advancement of stationary fuel cells in California. In 2004, the Governing Board awarded two contracts to install two-250 kW molten carbonate fuel cell units at TST-Timco metal foundry in Fontana. This is part of an effort to deploy multiple fuel cell units in industrial/commercial applications to capitalize on the heat recovery potential of these higher temperature fuel cell technologies. The fuel cell units at TST-Timco have been in operation since Spring 2006. Demonstrating fuel cells in these industrial/commercial settings, where high efficiency and economical operation are demanded, will provide excellent opportunities to identify optimum performance scenarios. These data can then be used by other industries to select the most appropriate fuel cell technology for deployment.

The District is developing and demonstrating an integrated hydrogen production, storage, and fuel cell power facility located at the ~~District's AQMD's~~ Diamond Bar headquarters. Currently, hydrogen is produced renewably using an electrolyzer powered by an upgraded solar array; the hydrogen is used for fueling hybrid internal combustion engine (ICE) vehicles and fuel cell vehicles, and can be used to fuel an ICE generator for backup and premium power. The ~~District AQMD~~ is also considering adding an energy station, which is a stationary fuel cell coupled with hydrogen production for vehicle fueling. This demonstration project exemplifies the required technology integration for a near-zero emission hydrogen economy. The engineering, operational, and economical integration scenarios will be addressed to provide data for key decision makers. All of these types of projects will help assess the different fuel cell technologies in realistic situations and advance the commercialization of truly viable products.

Hybrid-Electric Vehicles and Advanced Batteries

Hybrid electric systems can vary significantly in their design configurations as well as components. Hybrid electric vehicles (HEVs) are typically either parallel or series systems, but the variety of designs is increasing. Engines of various sizes can either drive a generator to charge the batteries or provide power directly to the wheels or both. The batteries can provide primary power to the traction drive motor or supplement the internal combustion engine (ICE). The major automobile manufacturers have been actively developing and commercializing HEVs with the objective of meeting the CARB LEV II regulations, which provide mechanisms for technologies other than battery electric and hydrogen fuel cells to earn partial ZEV credits.

Innovative approaches to HEV systems are also under development that could improve performance, fuel efficiency, and reduce emissions relative to the first HEVs commercially introduced. Innovations that may be considered for demonstration include: advancements in the auxiliary power unit, either ICE or other heat engine, especially using alternative fuels including natural gas and hydrogen; battery-dominant hybrid systems utilizing off-peak re-charging; and non-conventional light-duty and medium-duty HEVs including delivery vans, shuttles, and other medium-duty vehicles.

Of particular interest are HEV strategies that can plug in to an ordinary wall socket to recharge the larger battery pack, enabling the vehicle to operate on battery-only for several miles with the engine coming on just as needed to sustain the batteries. This type of “plug-in” HEV can provide true zero-tailpipe emissions for a portion of the driving cycle but can also make extended trips by refueling quickly with gasoline or other fuel.

One major OEM has partnered with District AQMD and others to demonstrate prototype plug-in hybrid vans with up to 20 miles electric range.

The District has also been involved in the development and demonstration of energy storage systems for electric and hybrid-electric vehicles, including lead acid, nickel-cadmium, and lithium-ion (Li-Ion) battery packs. Lead acid batteries continue to be preferred for low speed vehicle applications and serve as cost-effective energy storage as well as counterweight for electric forklifts. Over the past few years, additional technology consisting of nickel sodium chloride and lithium manganese batteries have been used in light- and heavy-duty applications. NiMH batteries have been deployed in most gasoline fueled passenger hybrid vehicles from major OEMs, but increasing competition for nickel in the production of stainless steel has increased the cost of all nickel containing products. Commercialization of Li-Ion advanced batteries for consumer electronics and power tools may help increase production volumes and reduce the cost for these batteries, enabling Li-Ion power batteries to replace NiMH in many hybrid vehicle applications. A variety of Li-Ion battery

designs are in development to optimize power, energy, life, and cost/weight reductions for safe implementation in vehicles.

Other technology providers are developing alternative energy storage devices, including ultracapacitors, flywheels and hydraulic systems. Flywheel systems can capture the kinetic energy from internal combustion engines, microturbines, and regenerative braking systems, store the energy, and then re-release the energy to provide electric power. Hydraulic energy storage systems are available in various forms. Typically, these systems can store retardation energy and provide this energy as a secondary source of propulsion, especially during acceleration. These hydraulic hybrid systems have shown significant fuel economy benefits in refuse truck applications. Both energy storage systems can be retrofitted into existing platforms to significantly increase fuel economy, especially in medium- and heavy-duty vehicles with frequent stopping in urban environments.

Goods Movement Related Sources (Marine Vessels, Portside Equipment, Locomotives, and On-Road Vehicles)

Marine vessels and portside equipment, which primarily run on diesel fuel, contribute a significant portion of NO_x, PM₁₀, greenhouse gas and toxic emissions particularly in coastal regions and in and around shipping ports. However, implementation of the cost-effective District and CARB programs has resulted in significant emission reductions through incentive programs such as RECLAIM Executive Order Emissions Mitigation, RECLAIM AQIP, Rule 2202 AQIP, Carl Moyer, and State Emissions Mitigation programs. The primary emission reduction technologies are outlined below.

Replacement with Cleaner Technologies/Equipment

Replacement existing older trucks and cargo handling equipment (CHE) with new models offers major opportunities for NO_x and PM emission control. The District, CARB, Ports of Los Angeles and Long Beach, and Gateway Cities are involved in implementing fleet modernization and expansion programs, and one segment of the program involves the use of natural gas drayage trucks at the ports. Existing diesel CHE can be replaced with cleaner technologies using on-road diesel or alternative fueled engines. Relative to ocean-going vessels, new ships that are cleaner than the International Maritime Organization (IMO) emission standards could be routed to South Coast marine ports. This approach is adopted in CARB's Goods Movement Emission Reduction Plan and is being considered for the San Pedro Bay Ports Clean Air Action Plan. Existing diesel locomotives could be replaced with hybrid (Green Goat type) locomotives, alternative fueled locomotives, or fuel cell locomotives in the future.

Retrofit with Cleaner Technologies Retrofitting trucks, CHE, locomotives, and marine vessels with diesel particulate filters (DPF), selective catalytic reduction (SCR), diesel oxidation catalyst (DOC), and emulsified fuel offer significant emission reduction opportunities. In Europe, DPFs are being used on locomotives and NOx reductions are achieved on ocean-going vessels through the use of SCR and water emulsification technologies. Water emulsification and slide valves are cost effective approaches to reduce oxides of nitrogen and particulate matter from ocean-going vessels.

Another alternative is to use SCR and DPF in stationary units and direct the emissions of the idling locomotives and marine vessels into the cleanup apparatus through a “bonnet” system. Advanced Cleanup Technologies, Inc. has developed this technology and successfully demonstrated the system at the Roseville Railyard in partnership with CARB, the District, and Union Pacific. This technology will also be applied at the Port of Long Beach in 2007. Both the on-road and stationary SCR systems offer the potential for greatly reducing NOx and PM by up to 90%.

Use of Alternative Fuels and Other Cleaner Fuels

Significant oxides of nitrogen and particulate matter emission reductions have been associated with the use of alternative fuels such as natural gas, liquid petroleum gas (LPG), emulsified diesel, or biodiesel (as long as any associated oxides of nitrogen emission increases are mitigated) wherever possible in on-road heavy-duty vehicles, CHE, locomotives, and marine vessels. Alternatives to diesel such as gas to liquids (Fisher-Tropsch Diesel) and Di-Methyl Ether (DME) can also reduce NOx and PM emissions. The use of biodiesel can also have beneficial impacts relative to PM reductions. Depending upon the biodiesel blends, increased NOx emissions may be mitigated through fuel borne additives. CARB recently adopted a regulation requiring the use of 0.5% sulfur marine distillate fuels in auxiliary engines when marine vessels are within 24 miles of the California coastline. Maersk, one of the largest cargo shipping lines, announced in 2006 that they will be using a 0.2% marine distillate fuel immediately.

For light-duty vehicles, greater attention has been given to E-85 fuel to reduce dependency on petroleum fuel. Presently, auto manufacturers only manufacture flexible fuel vehicles that operate on either gasoline or E85. However, encouraging greater use of E85 fuel would result in additional emission benefits.

Electrification of goods movement related vehicles and equipment should also be considered. Electrification of the infrastructure at the ports and the Alameda Corridor can significantly reduce emissions from on-road trucks and locomotives. Providing shore-side power for marine vessels while at berth will also greatly reduce the emissions that would otherwise result from hotelling.

Advanced Transportation Infrastructure

Advanced container transportation systems such as Maglev or other linear induction technologies could be used to transfer containers from the ports to “distant” intermodal facilities thereby significantly reducing emissions from on-road trucks and locomotives. A test Maglev track capable of moving 20-foot cargo containers, built by General Atomics, is in operation in San Diego. The Texas Transportation Institute has proposed a “Freight Shuttle System” using linear induction motors to move cargo containers between the ports and inland facilities. The Maglev and Freight Shuttle System approaches also reduce noise pollution and fugitive dust. On-dock container loading onto locomotives instead of moving containers by trucks to an interim intermodal site can also reduce significant amounts of emissions from on-road trucks. Emission reductions from on-dock container loading can be further enhanced/increased with the use of automated crane systems operating on electricity or incorporating cleaner advanced control technologies.

Advanced Engine and After-Treatment Technologies

With the introduction of low-sulfur diesel, many emission control technologies that were not otherwise possible with conventional diesel fuel are now being planned for use in diesel engines. These technologies include diesel particulate filters (DPFs), diesel oxidation catalysts (DOCs), exhaust gas recirculation (EGR), improved fuel injection and electronics, and improved air handling (variable geometry turbochargers). Most on-road diesel engines starting in 2007 will have DPFs and EGR.

Heavy-duty engine technologies are also under development to meet the 0.2 g/bhp-hr NO_x standard for 2010 models. These include lean NO_x absorbers, selective catalyst reduction (SCR), lean NO_x catalysts, advanced fuel injection, and more powerful electronics. For natural gas engines, additional technologies include advanced natural-gas direct-injection systems, three-way catalysts (TWC) with stoichiometric combustion, and electronically controlled engine valves (“throttleless” engine). These technologies will enable heavy-duty engines to operate with very low emissions while retaining good performance and acceptable fuel economy. Two major natural gas engine manufacturers announced their intentions to have natural gas engines certified to 2010 emissions standards as early as 2007. Once these technologies are adopted on new engines and vehicles, they have the capability to achieve even lower emissions as the technologies mature. Future emission performance includes reduced deterioration, possible ULEV- or SULEV-type emissions (0.05 g/bhp-hr NO_x or lower), zero air toxics, and better fuel economy.

The reduction in heavy-duty emissions can be multiplied by incorporating these low-emission engines into hybrid vehicles. Such vehicles use two propulsion schemes: a low-emission engine and auxiliary propulsion such as an electric drive system, or a

low-emission engine with hydraulic pump and pressure storage system. In addition to propelling the vehicle, the auxiliary systems are used to store energy normally lost during braking and re-use this energy to propel the vehicle, reducing both emissions and fuel consumption. With new heavy-duty engine technologies, natural-gas hybrid vehicles have the capacity to achieve near-zero emissions, as low as fuel cell vehicles with onboard fuel reforming.

Renewable Power Generation Technologies

Renewable power generation technologies such as solar and wind electric power generation technologies may also play a role in long-term attainment strategies. The District will evaluate the application of renewable power generation technologies through market incentive programs in order to achieve additional emission reductions (e.g., area source credit rule). Future market incentive programs will focus on renewable power generation technologies used in residential and commercial applications.

Other possible strategies for increasing the penetration of renewable power generating technologies include encouraging solar and wind turbine use where applicable. Examples of possible renewable energy applications include powering electric motors used to run agricultural pumps with wind energy and utilizing solar panels in the residential and commercial sectors. The District has provided incentive money to convert diesel powered agricultural pumps to electric motors. The eastern portion of the district may have sufficient wind resources such that these electric motors could be cost-effectively driven by wind energy.

For the last few years, there have been substantial incentives available from California Public Utilities Commission and California Energy Commission to install solar panels on private residential rooftops. These incentives have been heavily utilized by the commercial sector, but those for the residential sector remain substantially unused, due to lack of awareness by the public. While LADWP is vigorously advertising the availability of their incentives, other energy providers have done less in this regard. The District can possibly promote and, depending on the availability of funds, leverage the incentives for rooftop solar panels currently available from other public agencies.

The District has also recently augmented its current 20 kW solar array with an additional 80 kW system consisting of 344 semi-crystalline solar panels. The 100 kW of solar energy is used to help offset the District's electrical load while also providing an educational opportunity with a computer kiosk in the headquarters main lobby to show visitors the real-time benefits of solar power.

The District is also investigating renewable fuels, including biodiesel, ethanol, and gas-to-liquids. All of these projects are being conducted to ensure the air quality emissions are not increased when using these fuels. The District is keenly interested in reducing both greenhouse gas emissions and petroleum use, but not at the expense of addressing criteria pollutants.

Advanced Low-VOC Technologies

VOC emissions from stationary sources result primarily from the use of VOC containing materials such as coatings, inks, adhesives and cleaning solvents. The VOC-containing materials are used in a wide variety of industries which include: manufacturing and coating of metal, wood, plastic, and other products; printing operations such as lithography, flexography, screen printing, gravure and letterpress; cleaning operations at repair and maintenance facilities; and numerous industries where adhesives are used.

Some of the advanced low-VOC alternative technologies developed by the industry include: waterborne technologies, radiation-curing technologies, and high solids, powder coating technologies, and exempt solvent-based formulations.

Waterborne Technology

One way of eliminating VOC emissions is to replace solvent-based products with waterborne products. Typical solvent-based products are comprised of resins and solids dissolved in the solvent, which evaporates and leaves behind the pigment and resin to form the dried film. With waterborne products, the resins are dissolved in water, but typically dry to a non-water soluble film upon the substrate. Waterborne products also contain some VOCs, which work as a coalescent, provide resin stability, and help achieve certain desirable properties for application. Waterborne technology is quite advanced in most chemistry types, with recent research being done to minimize the amount of solvent or to attempt to switch to the non-HAP (Hazardous Air Pollutant) solvents.

The drying properties of waterborne products are more sensitive to ambient temperature and humidity characteristics, as compared to their solvent-based counterparts. The newer resin chemistries and formulations offer many advantages, which include lower VOC emissions, reduced fire hazards, increased worker safety, lower odor, ease of application, and easy cleanup. Waterborne technology has been successfully used in automotive refinish, wood refinishing, industrial maintenance, architectural and marine coatings; flexographic, screen and gravure printing; adhesives, and cleaning solvents. Overall performance studies completed to date indicate equivalent or superior performance compared to their higher-VOC solvent-based counterparts.

Radiation-Curing Technologies

Radiation-curing products are liquids with low viscosity that are 100 percent solids. The main difference between traditional solvent-based products and radiation-curing products is the curing mechanism. Radiation-curing products do not dry in the sense of losing solvents to the atmosphere as is the case with solvent-based products. Instead, when radiation-curing products are exposed to radiation, a polymerization reaction starts which converts the liquid to a hard, tough, cured solid film in a fraction of a second. This process typically results in significantly lower VOC emissions compared to solvent-based products. The most common radiations used to cure the products are ultraviolet light (UV) and electron beam (EB). The UV-curing products need a chemical called photoinitiator, which initiates the polymerization (curing) process when exposed to UV-light. The EB-cured products do not contain photoinitiators and are cured when the electrons generated with the EB equipment react directly with monomers and polymers in the liquid product.

Due to almost instant curing of these products, the concept of drying time is eliminated which allows any post-application operation to commence immediately or in-line. Other advantages include the attainment of very high gloss levels, reduction of VOC emissions and solvent odors, and reduced energy consumption. UV and EB-curing products can be used on virtually all substrates, from metal and wood to glass and plastic. Applications of UV and EB-curing products are numerous and proliferating rapidly. Examples include: paper, furniture, automotive components, no-wax flooring, credit cards, packaging, lottery tickets, golf balls, eyeglass lenses, CDs, baseball bats, beer cans and hundred of other items. These technologies have also registered significant progress toward alleviating previous limitations in technology for field applications. UV applications are also making headway in automotive field repair, and efforts are underway for applying this technology for aerospace and military field uses.

High Solids Technology

Another way of reducing VOC emissions is to replace conventional low solids products with higher solids products, thus reducing VOC content. This requires product formulators to increase the solid content, while maintaining the important application and performance characteristics. The characteristics of higher and low solids products are significantly different. This makes the development of high-performance, higher solids products a more difficult formulating task than simply replacing the amount of solvent used in low solids products. A higher solids content increases the viscosity and, in some cases, the surface tension, as well as affecting application and performance properties. While these increases can be minimized by the utilization of lower molecular weight polymers, they can be further reduced by the incorporation of a good solvent system into the formulation. The combination of reducing the molecular weight of the polymer and employing a balanced solvent system has contributed to the successful development of many of the commercial higher solids products in use today.

Powder Coating Technology

Powder coating is a 100 percent solid coating with virtually no VOC emissions. In a powder coating application process, dry paint particles are supplied to a spray gun where particles acquire electrostatic charge. The charged particles are sprayed and attracted to a grounded object and form a uniform layer of powder coating on its surface. The coating is then cured by applying heat.

Some of the benefits of this technology are: solvent-free systems, reduced fire risk and associated insurance costs, reduced waste disposal cost, good solvent and chemical resistance, flexibility and impact resistance. Due to these benefits, powder coatings have become popular with OEM baked coating markets, especially in the decorative market. This system also has limited application for field finishing.

Exempt Solvent Technology

Over the past ten years, the U.S. EPA exempted several solvents with low photochemical reactivity from consideration as a VOC. These exempt solvents are used to extend or replace many organic solvents, including toluene, xylene, mineral spirits, acetone, methyl ethyl ketone, trichloroethylene, and perchloroethylene. Acetone, para chlorobenzotrifluoride, and to a limited degree, tertiary butyl acetate, have been incorporated into coating, adhesive, and cleaning solvent formulations, and have contributed to significant reduction in VOCs as well as HAPs.

Innovative Control Approaches

Because of the significant level of reductions needed for attainment demonstration, innovative control approaches need to be explored which can be implemented in conjunction with advanced emission control technologies. Innovative approaches including market incentive programs, reactivity-based controls, localized controls, and public awareness and education programs are briefly discussed here.

Market Incentive Programs

Since the adoption of the 1997/1999 SIP, the District has adopted several market incentive programs designed to offer stationary sources short-term compliance flexibility while at the same time incentivizing the introduction of low-emission mobile and area source technologies. In 2001, five pilot credit generation mobile and area source rules were adopted to allow generation of mobile source emission reduction credits (MSERCs) and area source credits (ASCs) that could be used as RECLAIM trading credits in the RECLAIM compliance program. A sixth pilot credit generation rule was adopted in 2002. The District has used collected monies from the Executive Order (EO) RECLAIM Mitigation Fee Program for power producing facilities to maximize the funding for low emission mobile and area source projects through the pilot credit generation programs. In turn, these programs have

allowed RECLAIM sources to obtain short-term compliance with their RECLAIM allocations while long-term solutions to meeting their allocations are sought. Credit generated under these programs cannot be used past a specific year which in most cases is 2006; however, one rule has a 2010 deadline.

Market incentive programs can continue to play a key role in the development and penetration of low-emission technologies. These programs can be expanded by maximizing the funding sources (e.g., private funding) to provide monies to purchase low-emission technologies. Expansion of these programs will continue to provide short-term flexibility for stationary sources while also producing creditable emission reductions after emission reduction credits can no longer be used (i.e., 2006 – 2010). Thus, any emission reductions still occurring after the rule's specific deadlines may be credited toward the current and future SIP commitments.

Reactivity-Based Controls

Over the past two decades, regulations for coating and solvents have primarily focused on lowering the VOC content which has significantly reduced the VOC emissions from these categories. Reformulation of high-VOC compounds to low-VOC alternatives has resulted in substantial reductions in VOC emissions and improvement of ambient air quality. However, different chemicals used in coatings and solvents would exhibit different reactivity rates in forming ozone in the atmosphere. Therefore, because of the need to achieve additional VOC reductions for ozone attainment demonstration, reformulation based on lower reactive compounds needs to be evaluated and considered in future rulemakings for coatings and solvents in order to provide a viable compliance option. Further study would also be required to evaluate the reactivity of different compounds under various meteorological conditions.

Localized Controls

To complement the 2007 AQMP's overall control strategies, localized controls may also be considered to achieve reductions from specific areas which contribute to the exceedance of ambient air quality standards. In instances where the exceedances of the air quality standards are attributed only to emissions from a specific geographical area, it would be infeasible to develop region-wide regulations for the purpose of attaining the standard in a local area. For example, it appears that local PM10 sources in the eastern portion of the Basin are primarily responsible for the remaining exceedance of PM10 air quality in that area. Therefore, it would be more feasible and cost-effective to develop localized controls to achieve the necessary reduction rather than subject the entire Basin to additional regulations which would not benefit the attainment in the local area. For this local area, the District is proposing to establish a localized program through a cooperative effort with local agencies to

reduce emissions from direct sources of PM. As the District nears the attainment dates for other federal air quality standards, localized controls may offer a more viable approach in meeting these standards.

Demand-Side Strategies

Demand-side strategies use differential pricing as a mechanism to influence consumer choice when purchasing or operating a product. Examples include charging higher fees for registering or purchasing a higher-emitting vehicle or a consumer product. Another example may include charging higher user fees for recreational boats for access to water ways unless their engines meet a low-emission standard. Charging a vehicle miles traveled (VMT) or emission-based fee for higher mileage and higher emitting vehicles, respectively, is another example. A pilot project could be considered as a way of initiating and evaluating this type of strategy. A task force could be convened to further explore and evaluate demand-side strategies. To improve public acceptance, these programs can be designed to minimize the socioeconomic impacts on low-income residents of the Basin.

Public Awareness and Education Programs

The concept of public awareness and education programs is to educate consumers and select area and stationary sources about lower-emitting products and process alternatives. The District instituted a program called Clean Air Choice in 2003 to increase public awareness of the availability of low-emission motor vehicles. ~~District AQMD~~ staff recruited voluntary support from new car dealerships in the four counties to place window stickers on new vehicles meeting the program's criteria for low emissions. The ~~District AQMD~~ is in the process of refocusing the program on direct outreach to consumers and new car buyers.

A possible method to implement a similar concept relative to consumer products would be through a certification program for manufacturers. Manufacturers of consumer products that meet or exceed a specified emission limit would be eligible for a label certified by CARB or the ~~District AQMD~~ that indicates that their product contains low or zero VOCs and is environmentally friendly.

For stationary and area sources, a series of public awareness programs could be established to educate facilities about control methods that would reduce emissions at their facility or business. Public awareness and education programs could include, but are not limited to, educational brochures, videos, articles, and workshops.

DISTRICT'S SIP EMISSION COMMITMENT

The SIP commitment of the 2007 AQMP is structured into two components: reductions from adopted rules and reductions from the 2007 AQMP control measures. Taken together, these reductions are relied upon to demonstrate expeditious progress and attainment of the federal PM_{2.5} and 8-hour ozone standards. The following sections first describe the methodology for SIP emission reduction calculations and the creditable SIP reductions, then describe what procedures will be followed to ensure fulfillment of the commitment.

SIP Emission Reduction Tracking

For purposes of tracking progress in emission reductions, the baseline emissions for the year 2014 annual average and 2023 planning inventory in the 2007 AQMP will be used, regardless of any subsequent new inventory information that reflects more recent knowledge. This is to ensure that the same “currency” is used in measuring progress as was used in designing the AQMP. This will provide a fair and equitable measurement of progress. Therefore, whether progress is measured by emission reductions or remaining emissions for a source category makes no difference. However, current emission inventory information at the time of rule development will continue to be used for calculating reductions, and assessing cost-effectiveness and socioeconomic impacts of the proposed rule. Therefore, for future rulemaking activity, both the current and AQMP inventories will be reported.

Any non-mandatory emission reductions achieved beyond the existing District regulations are creditable only if they are also SIP-enforceable. Therefore, in certain instances, the District may have to adopt regulations to reflect the existing industry practices in order to claim SIP reduction credit with the understanding that there may not be additional reductions beyond what has already occurred. Exceptions can be made where reductions are real, quantifiable, surplus to the 2007 AQMP baseline inventories, and enforceable through other State and/or federal regulations. Also, any emissions inventory revisions, which have gone through a peer review and public review process, can also be SIP creditable.

Reductions from Adopted Rules

A number of control measures contained in the 2003 AQMP have been adopted as rules. These adopted rules and their projected emission reductions become assumptions in developing AQMP's future year inventories. Although they are not part of the control strategy in the 2007 AQMP, continued implementation of those rules is essential in achieving clean air goals and maintaining the attainment demonstration. Table 1-2 of Chapter 1 lists the rules adopted by the District since the adoption of the 2003 AQMP and their expected emission reductions.

Reductions from District’s Stationary Source Control Measures

For purposes of implementing an approved SIP, the District is committed to adopt and implement control measures that will achieve, in aggregate, emission reductions specified in Table 4-~~109~~ (short- and mid-term measures). Emission reductions achieved in excess of the amount committed to in a given year can be applied to the emission reduction commitments of subsequent years. The District is committed to adopt the control measures in Table 4-2A and 4-2B unless these measures or a portion thereof are found infeasible and other substitute measures that can achieve equivalent reductions in the same adoption/implementation timeframes are adopted. Findings of infeasibility will be made at a regularly scheduled meeting of the District Board with proper public notification. For purposes of SIP commitment, infeasibility means that the proposed control technology is not reasonably likely to be available by the implementation date in question, or achievement of the emission reductions by that date is not cost-effective. The District acknowledges that this commitment is enforceable under Section 304(f) of the federal Clean Air Act.

Adoption and Implementation of District’s Stationary Source Control Measures (Table 4-2A and 4-2B) – In response to concerns raised by the regulated community that costly controls may be required to meet the SIP obligations, the District establishes a threshold of \$16,500 per ton of VOC reduction for tiered levels of analysis. Specifically, proposed rules with an average cost-effectiveness above the threshold will trigger a more rigorous average cost-effectiveness, incremental cost-effectiveness, and socioeconomic impact analysis. A public review and decision process will be instituted to seek lower cost alternatives. In addition, the District staff, with input from stakeholders, will attempt to develop viable control alternatives within the industry source categories that a rule is intended to regulate. If it is determined that control alternatives within the industry source category are not feasible, staff will perform an evaluation of the control measure as described in the next paragraph. Viable alternatives shall be reviewed by the District Governing Board at a public meeting no less than 90 days prior to rule adoption and direction given back to staff for further analysis. During this review process, incremental cost-effectiveness scenarios and methodology will be specified, and industry-specific affordability issues will be identified as well as possible alternative control measures. The District Governing Board may adopt the original or an alternative that is consistent with state and federal law. In addition, staff shall include in all set hearing items a notification that proposed rules do or do not exceed the cost threshold.

Adoption and Implementation of Alternative/Substitute Measures – Under the 2007 AQMP, the District will be allowed to substitute District stationary source measures in Table 4-2A with other measures, provided the overall equivalent emission reductions by adoption and implementation dates in Table 4-~~109~~ are maintained and the applicable measure in Table 4-2A is infeasible. In order to

provide meaningful public participation, when new control concepts are introduced for rule development, the District is committed to provide advanced public notification beyond its regulatory requirements (i.e., through its Rule Forecast Report). The District will also report quantitatively on the AQMP's implementation progress annually at its regularly scheduled Board meetings. Included in the reports will be any new control measures being proposed or measures, or portions thereof, that have been found to be infeasible and the basis of such finding. In addition, at the beginning of the year, any significant emission reduction related rules to be considered would be listed in the Board's Rule Forecast Report. Upon finding of a new feasible control measure, rule development will be completed no later than 12 months from the adoption date of the control measure substituted, and implementation of the new measure will occur no later than two years from the final implementation date of the measure substituted. The existing rule development outreach efforts such as public workshops, stakeholder working group meetings or public consultation meetings will continue to solicit public input. In addition, if additional technical analysis, including source testing, indicates that actual emissions are less than previously estimated, the reductions would then be creditable toward SIP commitments. In order for reductions from improved emission calculation methodologies to be SIP creditable, a public review process will also be instituted to solicit comments and make appropriate revisions, if necessary.

TABLE 4-109

Short- and Mid-Term VOC, NO_x, SO_x, and PM_{2.5} Emission Reductions Commitment by District AQMD to be Achieved Through Rule Adoption and Implementation 2014 Annual Average Inventory/2023 Planning Inventory (Tons/Day)

Year	VOC		PM _{2.5}		NO _x		SO _x	
	Based on Adoption Date	Based on Imple. Date ^a	Based on Adoption Date	Based on Imple. Date ^a	Based on Adoption Date	Based on Imple. Date ^a	Based on Adoption Date	Based on Imple. Date ^a
2007	0.8/0.7	<u>0.8/0.7</u>	<u>1.0/1.6</u>	---	0.4/0.4	<u>0.4/0.4</u>	---	---
		---	<u>0.7/0.7</u>	---		---		---
2008	3.1/4.2	---	0.4/0.4	<u>1.0/1.6</u>	5.6/6.9	---	3.0/3.0	---
				<u>0.7</u>				
2009	4.5/5.2	---	0.4/2.2	---	0.8/1.9	---	---	---
2010	2.0/9.2	<u>3.1/4.2</u>	<u>1.1/1.2</u>	<u>0.4/0.4</u>	---	<u>0.5/0.6</u>	---	---
		<u>3.6</u>						
2011	---	<u>0.8/0.6</u>	---	---	---	---	---	---
2012	---	<u>3.7/4.0</u>	---	---	---	---	---	---
2013	---	---	---	---	---	---	---	---
2014	---	---	---	<u>1.1/1.2</u>	---	<u>3.5/4.1</u>	---	<u>3.0/3.0</u>
2015	---	---	---	---	---	---	---	---
2016	---	---	---	---	---	---	---	---
2017	---	---	---	---	---	---	---	---
2018	---	---	---	---	---	---	---	---
2019	---	---	---	---	---	---	---	---
2020	---	---	---	---	---	---	---	---
2021	---	---	---	---	---	---	---	---
2022	---	---	---	---	---	---	---	---
2023	---	<u>2.0/11.1</u>	---	<u>0.4/2.2</u>	---	<u>2.4/5.1</u>	---	---
Total	10.4/19.3	<u>10.4/19.3</u>	<u>2.9/5.4</u>	<u>2.9/5.4</u>	6.8/9.2	<u>6.8/9.2</u>	3.0/3.0	3.0
			<u>1.5/3.3</u>	<u>3.3</u>				

^a Represents the final, full implementation date; typically a rule contains multiple implementation dates.

OVERALL EMISSION REDUCTIONS

A summary of emission reductions for the proposed control measures for the years 2014 and 2023 is provided in Tables 4-110 through 4-132. These reductions reflect the emission reductions associated with implementation of control measures under local, State, and federal jurisdiction. Emission reductions represent the difference between the projected baseline and the remaining emissions. For 2014, Table 4-110 identifies projected reductions based on the annual average inventory for all criteria pollutants (VOC, NOx, CO, SOx, and PM2.5). It represents the level of emission reductions needed to achieve the federal PM2.5 standard. For 2023, Tables 4-124 and 4-132 identify projected reductions based on the summer planning inventory for VOC and NOx emissions and the winter planning inventory for CO and NOx emissions. Emission reductions by 2023 illustrate the extent of controls needed for achieving the federal ozone standard.

TABLE 4-110

Emission Reductions for 2014 Based on Average Annual Emissions Inventory
(tons per day)

Sources	VOC	NO _x	CO	SO _x	PM _{2.5}
Year 2014 Baseline ¹	527 <u>528</u>	654	2577	43	102
Baseline Adjustment ²	(0.5)	8	---	---	---
Emission Reductions:					
District's Short-Term and Mid-Term Control Stationary Source Control Measures	10	7	17 <u>0</u>	3	32
CARB's <u>Revised</u> Draft Proposed State Strategy	43 <u>42</u>	122 <u>125</u>	---	20	9
<u>SCAG's Goods Movement Measures</u> ³	---	<u>22</u>	---	---	---
District Staff's Proposed Additional Mobile Source Control Measures	6 <u>7</u>	41 <u>71</u>	--- <u>38</u>	1	2 <u>3</u>
Total Reductions (All Measures)	59	192 <u>203</u>	17 <u>38</u>	24	14
2014 Remaining Emissions	469	454 <u>443</u>	2535 <u>2560</u>	19	87 <u>88</u>

¹ Emission assumptions benefits from SCAG's 2004 Regional Transportation Plan Strategy and Control Measures are already reflected in the AQMP baseline.

² Reflects baseline inventory adjustments for CARB's adopted rules in 2006 for large spark-ignited engines (2.4 t/d NO_x) and consumer products (4.5 t/d VOC), emissions for the purpose of set-aside tracking (5 t/d VOC increase) and emission benefits from the Carl Moyer Program (4.2 t/d NO_x and 0.2 t/d PM_{2.5}) and NSR Program benefits (1.2 t/d NO_x). Emission benefits from the Carl Moyer Program presented in this table reflect the additional reductions not included in the baseline. () denotes emission increases. See Appendix III.

³ Reflects SCAG's two goods movement control measures. Refer to Appendix IV-C. Implementation of these measures may provide concurrent reductions in other pollutants which are not shown in this table.

TABLE 4-121
Emission Reductions for 2023 Based on
Summer Planning Inventory (tons per day)

Sources	VOC	NO _x
Year 2023 Baseline ¹	536	506
Baseline Adjustment ²	(0.2)	9
Emission Reductions:		
District's Short-Term and Mid-Term Control Stationary Source Control Measures	19	9
CARB's <u>Revised Draft Proposed State Strategy</u>	<u>54</u> 52	<u>141</u> 139
<u>SCAG's Goods Movement Measures</u> ³	---	<u>11</u>
District Staff's Proposed Additional Mobile Source Control Measures	<u>14</u> 17	<u>34</u> 56
Long-Term Measures ⁴	<u>29</u> 28	<u>188</u> 179
Total Reductions (All Measures)	116	383
2023 Remaining Emissions	420	114

¹ Emission assumptions/benefits from SCAG's 2004 Regional Transportation Plan Strategy and Control Measures are already reflected in the AQMP baseline.

² Reflects baseline inventory adjustments for CARB's adopted rules in 2006 for large spark-ignited engines (1.9 t/d NO_x) and consumer products (4.8 t/d VOC), emissions for the purpose of set-aside tracking (5 t/d VOC increase) and emission benefits from Carl Moyer Program (6.2 t/d NO_x) and NSR Program benefits (1.2 t/d NO_x). Emission benefits from the Carl Moyer Program presented in this table reflect the additional reductions not included in the baseline. () denotes emission increases. See Appendix III.

³ Reflects SCAG's two goods movement control measures. Refer to Appendix IV-C. Implementation of these measures may provide concurrent reductions in other pollutants which are not shown in this table.

⁴ Includes long-term reductions from SCLTM-01A, SCLTM-01B, SCLTM-02 and SCLTM-03. Refer To Appendix IV-B-2.

TABLE 4-132
Emission Reductions for 2023 Based on
Winter Planning Inventory (tons per day)

Sources	CO	NO _x
Year 2023 Baseline ¹	2058	520
Baseline Adjustment ²	0	9
Emission Reductions:		
District's Short-Term and Mid-Term Control Stationary Source Control Measures	<u>19</u> 0	12
CARB's <u>Revised</u> Draft Proposed State Strategy	----	<u>142</u> 140
<u>SCAG's Goods Movement Measures</u> ³		<u>11</u>
District Staff's Proposed Additional Mobile Source Control Measures	<u>92</u>	<u>27</u> 52
Long-Term Measures ³⁴	----	<u>193</u> 186
Total Reductions (All Measures)	<u>19</u> 92	<u>385</u> 390
2020 Remaining Emissions	<u>2039</u> 1966	<u>421</u> 426

¹ Emission assumptions/benefits from SCAG's 2004 Regional Transportation Plan Strategy and Control Measures are already reflected in the baseline.

² Reflects baseline inventory adjustments for CARB's adopted rules in 2006 for large spark-ignited engines (1.9 t/d NO_x), emission benefits from Carl Moyer Program (6.2 t/d NO_x) and NSR Program benefits (1.2 t/d NO_x). Emission benefits from the Carl Moyer Program presented in this table reflect the additional reductions not included in the baseline. See Appendix III.

³ Reflects SCAG's two goods movement control measures. Refer to Appendix IV-C. Implementation of these measures may provide concurrent reductions in other pollutants which are not shown in this table.

³⁴ Includes long-term reductions from SCLTM-01A, SCLTM-01B, and SCLTM-02. (Refer To Appendix IV-B-2). .