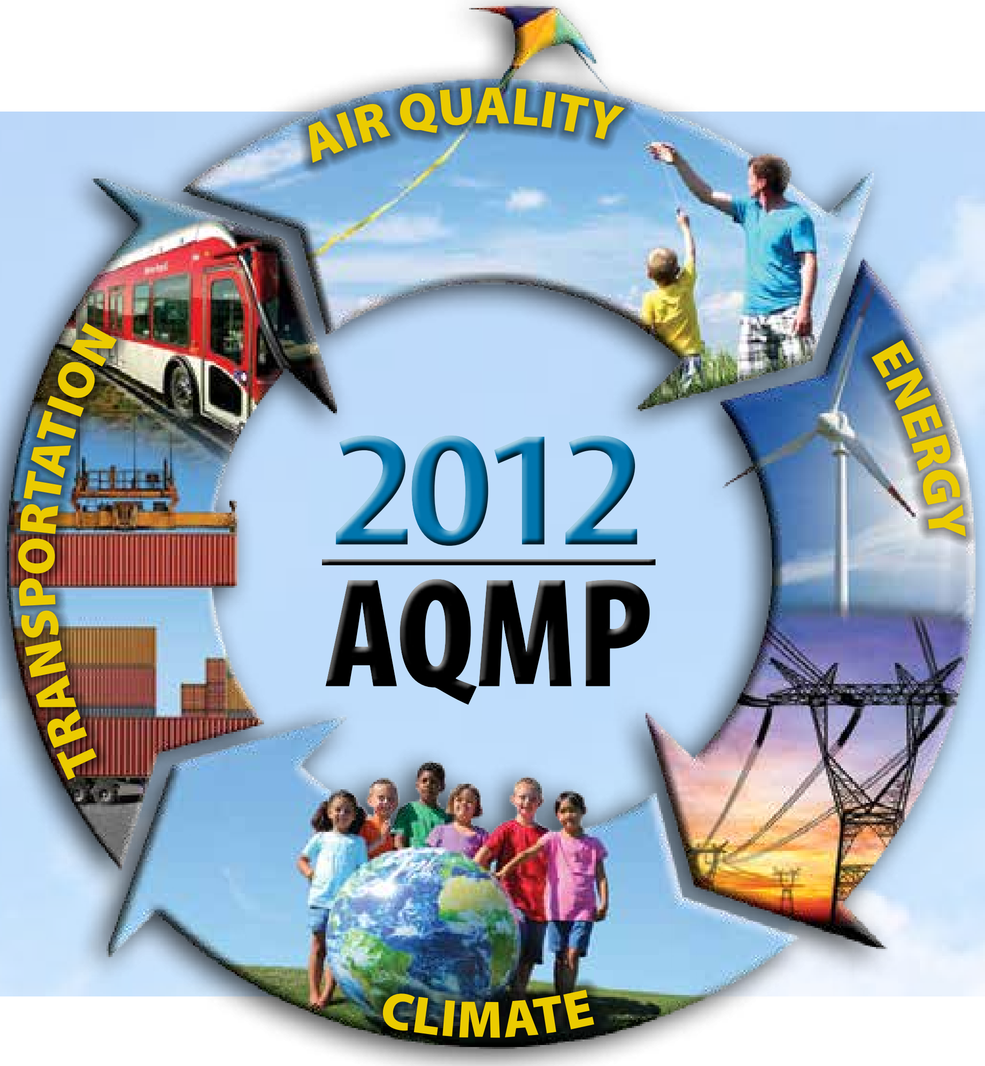
Final Program Environmental Impact Report for the 2012 Air Quality Management Plan



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South Coast Air Quality Management District
Cleaning the air that we breathe...

AQMD

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PREFACE

This document constitutes the Final Program Environmental Impact Report (EIR) for the 2012 Air Quality Management Plan (AQMP). The Draft Program EIR was released for a 45-day public review and comment period from September 7, 2012 to October 23, 2012. It was concluded in the Draft Program EIR that the 2012 AQMP has the potential to generate significant adverse environmental impacts to the following environmental topic areas: construction air quality, energy (increased electricity and natural gas demand), hazards and hazardous materials, water demand, construction noise, and transportation and traffic. Measures were identified to mitigate to the maximum extent feasible potentially significant adverse impacts to all environmental topics identified above. In spite of implementing all feasible mitigation measures, impacts to all environmental topics remained significant. In addition, the Draft Program EIR included analyses of potentially significant adverse cumulative environmental impacts and identified and evaluated the relative merits of four project alternatives, including a No Project Alternative, and compared impacts from the project alternatives to the potential impacts from the 2012 AQMP. Thirteen comment letters were received from the public during the public comment period regarding the environmental analyses in the Draft Program EIR. These comment letters and the responses to individual comments are included in Appendix G of this document. No comments in these letters identified other potentially significant adverse environmental impacts from the proposed project not already analyzed in the Draft Program EIR.

In anticipation that the U.S. EPA would likely request that the SCAQMD prepare a federal one-hour ozone SIP, the 2012 AQMP contains ozone control measures that address the federal one-hour ozone standard (revoked) and contributes to making expeditious progress to attain the federal eight-hour ozone standard by 2023. All ozone control measures in the 2012 AQMP were evaluated in the Draft Program EIR. On September 19, 2012, the U.S. EPA published in the Federal Register a proposed "SIP call" which, if finalized, would require the SCAQMD to prepare a demonstration of attainment of the one-hour ozone standard, with attainment required ten years from the date the SIP call is finalized. The same day, the U.S. EPA published in the Federal Register a proposal to withdraw its approval of, and then to disapprove, the transportation control measure (TCM) demonstrations, also referred to as VMT emissions offset demonstrations, in the 2003 one-hour ozone plan and the 2007 eight-hour ozone plan. In response to the two U.S. EPA actions above and in anticipation that they will be finalized, SCAQMD staff has prepared the *One-hour Ozone Attainment Demonstration*, which demonstrates attainment of the federal one-hour ozone standard (revoked) by the year 2022 (2012 AQMP Appendix VII) and the *VMT Offset Requirement Demonstration* (2012 AQMP Appendix VIII). These documents and other minor modification to the proposed project made after circulation of the Draft Program EIR were evaluated by staff and it was concluded that they did not change in any way any conclusions regarding the significance of environmental impacts in the Draft Program EIR.

To facilitate identifying changes in this Final Program EIR, modifications to the document are included as <u>underlined text</u> and text removed from the document is indicated by ~~strikethrough~~. To avoid confusion, minor formatting changes are not shown in underline or strikethrough mode. Staff has reviewed the modifications to the proposed project, including the documentation in new Appendices VII and VIII, and concluded that none of the modifications alter any conclusions reached in the Draft SEA nor provide new information of substantial importance relative to the draft document. As a result, none of the revisions to the Program EIR reflected in this document require recirculation of the document pursuant to CEQA Guidelines §15088.5. Therefore, this document is now constitutes the Final Program EIR for the 2012 AQMP.

CHAPTER 1

INTRODUCTION AND EXECUTIVE SUMMARY

1.1 INTRODUCTION

The California Legislature adopted the Lewis Air Quality Act in 1976, creating the South Coast Air Quality Management District (SCAQMD) from a voluntary association of air pollution control districts in Los Angeles, Orange, Riverside, and San Bernardino counties. The new agency was charged with developing uniform plans and programs for the South Coast Air Basin (Basin) to attain federal air quality standards by the dates specified in federal law. While the Basin has one of the worst air quality problems in the nation, there have been significant improvements in air quality in the Basin over the last two decades, although some air quality standards are still exceeded relatively frequently, and by a wide margin. The agency was also required to meet state standards by the earliest date achievable through the use of reasonably available control measures.

The Lewis Air Quality Act (now known as the Lewis-Presley Air Quality Management Act) requires that the SCAQMD prepare an Air Quality Management Plan (AQMP) consistent with federal planning requirements. In 1977, amendments to the federal Clean Air Act (CAA) included requirements for submitting State Implementation Plans (SIPs) for non-attainment areas that fail to meet all federal ambient air quality standards (Health & Safety Code §40462). The federal CAA was amended in 1990 to specify attainment dates and SIP requirements for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2) and particulate matter less than 10 microns in diameter (PM10). The California Clean Air Act (CCAA), adopted in 1988, requires the SCAQMD to endeavor to achieve and maintain state ambient air quality standards for ozone, CO, sulfur dioxide (SO_2), and NO_2 by the earliest practicable date (Health & Safety Code §40910), and establishing requirements to update the plan periodically.

The first AQMP was prepared and approved by the SCAQMD in 1979 and has been updated and revised a number of times. The CCAA requires a three-year plan review and update to the AQMP. The following bullet items summarize the main components of those updates and revisions.

- In 1982, the AQMP was revised to reflect better data and modeling tools.
- In 1987, a federal court ordered the United States Environmental Protection Agency (U.S. EPA) to disapprove the 1982 AQMP because it did not demonstrate attainment of all national ambient air quality standards (NAAQS) by 1987 as required by CAA. This, in part, led to the preparation of the 1989 AQMP.
- The 1989 AQMP was adopted on March 17, 1989, and was specifically designed to attain all NAAQS. This plan called for three “tiers” of measures as needed to attain all standards and relied on significant future technology advancement to attain these standards.
- In 1991, the SCAQMD prepared and adopted the 1991 AQMP to comply with the CCAA.

- In 1992, the 1991 AQMP was amended to add a control measure containing market incentive programs.

- In 1994, the SCAQMD prepared and adopted the 1994 AQMP to comply with the CCAA three-year update requirement and to meet the federal CAA requirement for an ozone SIP. The AQMP, as adopted in 1994, included the following.

  - All geographical areas under the jurisdiction of the SCAQMD (referred to herein as the district), as opposed to the Basin.

  - The basic control strategies remained the same although the three-tiered structure of control measures was replaced. Measures previously referred to as Tier I, II, or III were replaced with short-/intermediate-term or long-term control measures;

  - Updated and refined control measures carried over from 1991;

  - The federal post-1996 rate of progress demonstration;

  - Best Available Control Measure (BACM) PM10 Plan;

  - The ozone attainment demonstration plan;

  - Amendments to the federal Reactive Organic Compound (ROC) Rate-of-Progress plan also referred to as the VOC Rate-of Progress Plan;

  - Attainment Demonstration Plans for the federal PM10, nitrogen dioxide, carbon monoxide air quality standards;

  - Expanded use of market incentives;

  - New public outreach and education programs; and

  - Manufacturer-certified products and equipment.

- The 1997 AQMP was designed to comply with the three-year update requirements specified in the CCAA as well as to include an attainment demonstration for PM10 as required by the federal CAA. Relative to ozone, the 1997 AQMP contained the following changes to the control strategies compared to the 1994 AQMP:

  - Less reliance on transportation control measures (TCMs);

  - Less reliance on long-term control measures that rely on future technologies as allowed under §182 (e)(5) of the CAA; and

  - Removal of other infeasible control measures and indirect source measures.

- In 1999, the ozone plan portion of the 1997 AQMP was amended to address U.S.EPA concerns with the 1997 AQMP plan to provide the following:
  - Greater emission reductions in the near-term than would occur under the 1997 AQMP;
  - Early adoption of the measures that would otherwise be contained in the next three-year update of the AQMP; and
  - Additional flexibility relative to substituting new measures for infeasible measures and recognition of the relevance of cost effectiveness in determining feasibility.
- In April 2000, U.S. EPA approved the 1999 ozone SIP Amendment to the 1997 plan. The 1999 Amendment in part addressed the State's requirements for a triennial plan update.
- The 1997 PM10 SIP, as updated in 2002, was deemed complete by U.S. EPA in November 2002 and approved on April 18, 2003.
- The 2003 AQMP was adopted by the SCAQMD in August 2003. The 2003 AQMP has not yet been approved by the U.S. EPA as part of the SIP. The 2003 AQMP addressed the following control strategies:
  - Attaining the federal PM10 ambient air quality standard for the South Coast Air Basin and Coachella Valley – these portions were approved by the U.S. EPA; in both areas, the attainment demonstration was disapproved by the California Air Resources Board (CARB) withdrew its measures;
  - Attaining the federal one-hour ozone standard;
  - 1997/1999 control measures not yet implemented;
  - Discussion regarding credit/incentive programs and their role in achieving overall emission reduction targets;
  - Revisions to the Post-1996 VOC Rate-of-Progress Plan and SIP for CO;
  - Initial analysis of emission reductions necessary to attain the particulate matter less than 2.5 microns in diameter (PM2.5) and eight-hour ozone standards;
  - The 2003 AQMP was partially approved and partially disapproved.
- The SCAQMD Governing Board approved the 2007 AQMP on June 1, 2007. On September 27, 2007, CARB adopted the State Strategy for the 2007 SIP and the 2007 AQMP as part of the SIP. The following summarizes the major components of the 2007 AQMP:

- The most current air quality setting (e.g., 2005 data);
- Updated emission inventories using 2002 as the base year, which also incorporate measures adopted since adopting the 2003 AQMP;
- Updated emission inventories of stationary and mobile on-road and off-road sources;
- 2003 AQMP control measures not yet implemented (eight of the control measures originally contained in the 2003 AQMP have been updated or revised for inclusion into the Draft 2007 AQMP);
- 24 new measures are incorporated into the 2007 AQMP based on replacing the SCAQMD's long-term control measures from the 2003 AQMP with more defined or new control measures and control measure adoption and implementation schedules;
- SCAQMD's recommended 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;
- SCAG's regional transportation strategy and control measures; and
- Analysis of emission reduction necessary and attainment demonstration to achieve the federal eight-hour ozone and PM2.5 air quality standards.

On November 22, 2010, U.S. EPA issued a notice of proposed partial approval and partial disapproval of the 2007 South Coast SIP for the 1997 Fine Particulate Matter Standards and the corresponding 2007 State Strategy. Specifically, U.S. EPA proposed approving the SIP's inventory and regional modeling analyses, but it also proposed disapproving the attainment demonstration because it relied too extensively on commitments to emission reductions in lieu of fully adopted, submitted, and SIP-approved rules. The notice also cited deficiencies in the SIP's contingency measures.

- In response the U.S. EPA's proposed partial disapproval of the 2007 SIP, on March 4, 2011, the SCAQMD Governing Board approved Revisions to the 2007 PM2.5 and Ozone State Implementation Plan for the South Coast Air Basin and Coachella Valley. The revisions to the 2007 PM2.5 and Ozone SIP consist of the following:
  - Updated implementation status of SCAQMD control measures necessary to meet the 2015 PM2.5 attainment date;
  - Revisions to the control measure adoption schedule;
  - Changes made to the emission inventory resulting from CARB's December 2010 revisions to the on-road truck and off-road equipment rules; and

- An SCAQMD commitment to tis “fair share” of additional NOx emission reductions, if needed, in the event U.S. EPA does not voluntarily accept the “federal assignment.”

- In response to the July 14, 2011 U.S. EPA notice of proposed partial approval and partial disapproval of the 2007 South Coast IP for the 1997 Fine Particulate Matter Standards, at the October 7, 2011 public hearing, the SCAQMD Governing Board approved Further Revision s to PM2.5 and Ozone State Implementation Plan for South Coast Air Basin and Coachella Valley. Revisions to the PM2.5 SIP included a three-prong approach for identifying contingency measures needed to address U.S. EPA’s partial disapproval:

    - Equivalent emission reductions achieved through improvements in air quality;
    - Relying on committed emission reductions for the 2007 ozone plan;
    - Quantifying excess emission reductions achieved by existing rules and programs that were not originally included in the 2007 PM2.5 SIP;
    - U.S. EPA approved the PM2.5 SIP except for contingency measures on November 9, 2011. Action is pending on the contingency measures; and
    - U.S. EPA approved the 2007 SIP for the 8-hour ozone standard on March 1, 2012.

- The 2012 AQMP outlines a comprehensive control strategy that meets the requirement for expeditious progress towards attainment with the 24-hour PM2.5 federal ambient air quality standard with all feasible control measures and demonstrates attainment of the standard by 2014. The 2012 AQMP is also an update to the 8-hour ozone control plan with new emission reduction commitments from a set of new control measures, which implement the 2007 AQMP’s Section 182 (e)(5) commitments.

1.2 CALIFORNIA ENVIRONMENTAL QUALITY ACT

Pursuant to the California Environmental Quality Act (CEQA), this Final Program Environmental Impact Report (~~P~~EIR) has been prepared to address the potential environmental impacts associated with the South Coast Air Quality Management District’s ~~Draft~~ 2012 Air Quality Management Plan (AQMP). The 2012 AQMP is the planning document that sets forth policies and measures to achieve federal and state air quality standards in the region. CEQA Public Resources Code Section 21000 et seq., requires that the potential environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid identified significant adverse environmental impact from these projects be identified.

To fulfill the purpose and intent of CEQA, the SCAQMD staff has prepared this Final Program Environmental Impact Report (~~P~~EIR) to address the potential environmental impacts associated with the 2012 AQMP. Prior to making a decision on the ~~Draft~~ 2012 AQMP, the lead agency decision makers must review and certify the Final Program EIR as providing adequate information on the potential adverse environmental impacts of the AQMP.

1.2.1 Notice of Preparation/Initial Study

The original Notice of Preparation and Initial Study (NOP/IS) were distributed to responsible agencies and interested parties for a 30-day review and comment period on June 28, 2012 and 11 comment letters were received. A revised NOP/IS (included as Appendix A of this Final Program EIR) was recirculated on August 2~~1~~, 2012 for a 30-day comment period ending August 31, 2012, because changes were made to the 2012 AQMP project description during the comment period on the 6/28/12 NOP/IS. The recirculated Initial Study, referred to herein as the 8/2/12 NOP/IS, identified potential adverse impacts in the following environmental topics: aesthetics, air quality and greenhouse gas emissions; energy; hazards and hazardous materials; hydrology and water quality; solid/hazardous waste; and transportation and traffic. Based on public comments made relative to the 6/28/12 NOP/IS, the topics of land use and noise were also added to the Program EIR. The Program EIR also includes detailed responses to all 11~~9~~ comment letters received on the 6/28/12 NOP/IS ~~Initial Study~~ (see Appendix B). As indicated in Appendix C, no comment letters were received on the 8/2~~1~~/12 NOP/IS.

1.2.2 Program EIR Format

The overall format of the Program EIR is as follows:

Executive Summary
Chapter 1: Introduction
Chapter 2: Project Description
Chapter 3: Environmental Setting
Chapter 4: Environmental Impacts and Mitigation Measures
Chapter 5: Cumulative Impacts
Chapter 6: Alternatives
Chapter 7: References
Chapter 8: Acronyms

1.3 AREAS OF CONTROVERSY

CEQA Guidelines §15123 (b)(2) requires a public agency to identify the areas of controversy in the CEQA document, including issues raised by agencies and the public. Over the course of developing the 2012 AQMP, no areas of controversy were identified at the time of release of the NOP/IS relative to the environmental analysis. Further, SCAQMD had not been made aware of any areas of controversy relative to the environmental analysis in any of the comment letters received regarding the NOP/IS.

One comment letter received on the Draft Program EIR identified the following potential area of controversy. Concern was raised regarding the accuracy of the air quality inventory baseline, used as the basis for identifying potential air quality impacts, because it may not have included inventory information provided by the John Wayne Airport operators. However, as noted in response to comment #3-7 in Appendix G of this Final Program EIR, the 2012 AQMP baseline inventory was developed incorporating all information submitted by John Wayne Airport and SCAQMD staff will revise the Integra Report to reflect the updated information provided by the airport authority. Consequently, because the baseline inventory incorporates the data provided by the John Wayne Airport, this issue does not constitute an area of controversy.

Other comment letters were received on the Draft Program EIR, but none identified new issues relative to the environmental analysis or potential areas of controversy that could not be responded to in Appendix G. Since no areas of controversy were identified by SCAQMD or the public during the review and comment periods for both the NOP/IS and the Draft Program EIR, it is concluded that the proposed project does not contain any areas of controversy as defined by CEQA.

1.4~~3~~ EXECUTIVE SUMMARY: CHAPTER 2 - PROJECT DESCRIPTION

Implementation of the ~~Draft~~ 2012 AQMP control strategies requires a cooperative partnership of governmental agencies at the federal, state, regional and local level. At the federal level, the U.S. EPA is charged with regulation of on-road motor vehicle standards; trains, airplanes, and ships; certain non-road engines; and off-shore oil development. CARB also oversees on-road emission standards, fuel specifications, some off-road sources and consumer product standards. At the regional level, the SCAQMD is responsible for stationary sources and some mobile sources. In addition, the SCAQMD has lead responsibility for the development of the AQMP. Furthermore, at the local level, the Southern California Association of Governments (SCAG) has a dual role of leader and coordinator. In their leadership role, they, in cooperation with local jurisdictions and sub-regional associations, develop strategies for these jurisdictions to implement. As a coordinator, they facilitate the implementation of these strategies (e.g., transportation control measures).

Chapter 2 describes existing air quality regulations and details the proposed approach for the 2012 ~~revision to the~~ AQMP.

1.4~~3~~.1 Current Control Strategy

The SCAQMD has fulfilled the majority of its emissions reductions commitments specified in the 2007 State Implementation Plan (SIP). Through January 31, 2011, the SCAQMD Governing Board has amended and adopted 12 rules. The majority of these rules have been submitted to U.S. EPA and approved as part of the SIP. Several recently adopted SCAQMD rules have been submitted to CARB and have been or are expected to be submitted to and subsequently evaluated by U.S. EPA. By 2014, the control measures adopted by the SCAQMD over this period will have achieved 22.5 tons per day of VOC reductions, 7.6 tons per day of NOx reductions, 4.0 tons per day of SOx reductions, and 1.0 ton per day of PM2.5 reductions. Additional reductions from these adopted rules will be achieved by 2023.

Since the 2007 AQMP was adopted, CARB has adopted (either entirely or partially) many of the 2007 AQMP's control measure commitments. In combination with the regulatory activity and revised inventory forecast, CARB has achieved the emission targets for both 2014 and 2023.

1.4~~3~~.2 2012 AQMP Control Strategy

The overall control strategy for the ~~Draft~~ 2012 AQMP is designed to meet applicable federal and state requirements. The focus of the AQMP is to demonstrate attainment of the federal 24-hour PM2.5 ambient air quality standard by 2014, while making expeditious progress toward attainment of state PM standards. In addition, to further implement the existing 8-hour ozone plan, the ~~Draft~~ 2012 AQMP includes Section 182 (e)(5) implementation measures designed to assist in future attainment of the 8-hour ozone standard. The proposed control measures in the ~~Draft~~ 2012 AQMP are based on implementing all feasible control measures through the application of available technologies and management practices as well as development and deployment of advanced technologies and control methods. In addition, SCAQMD retains certain obligations relative to the (revoked) one-hour ozone standard. For purposes of the environmental analysis, it is expected that full implementation of the attainment strategy for the one-hour ozone standard would have the same environmental effects as implementing all the measures in the ~~Draft~~ 2012 AQMP and the Section 182 (e)(5) measures for the eight-hour standard that were already analyzed in the EIR for the 2007 AQMP. 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 approaches taken in previous AQMPs, the SIP commitment includes an adoption and implementation schedule for each control measure. Each agency is also committed to achieving a total emission reduction target with the ability to substitute specified control measures for control measures deemed infeasible, as 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 [§172 (c)], and the California requirement of Best Available Retrofit Control Technologies (BARCT) [Health and Safety Code §40440 (b)(1)].

To ultimately achieve the ozone ambient air quality standards and demonstrate attainment, significant NOx emissions reductions will be necessary, not only from non-vehicular sources under the jurisdiction of the SCAQMD, but substantial reductions will be necessary from sources 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 stationary sources that are already stringently regulated. The SCAQMD will continue to work closely with CARB to further control mobile source emissions where federal or State actions do not meet regional needs.

The ~~Draft~~ 2012 AQMP control measures consist of three components: 1) the SCAQMD's stationary and mobile source control measures; 2) suggested State mobile source control measures; and 3) Regional Transportation Strategy and control measures provided by SCAG. These measures rely on not only the traditional command-and-control approach, but also public incentive programs, as well as advanced technologies expected to be developed and deployed in the next several years.

1.~~5~~4 EXECUTIVE SUMMARY: CHAPTER 3 - ENVIRONMENTAL SETTING

Chapter 3 provides a detailed description of the existing setting of environmental resources identified as having potential significant impacts from the proposed project.

1.~~5~~4.1 Aesthetics

Aesthetic resources on federal lands are managed by the federal government using various visual resource management programs, such as the Visual Resource Management System utilized by the Federal Bureau of Land Management (BLM) and the Visual Management System utilized by the United States Forest Service (USFS).

The California Coastal Commission (CCC) regulates development projects within the coastal zone for jurisdictions that do not have a local coastal program (LCP) or land use plan (LUP). California's Scenic Highway Program helps to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of land adjacent to those highways. The nearest officially designated Scenic Highway to either the Ports and downtown Los Angeles would be Route 2 (Angeles Crest Scenic Byway) near La Canada/Flintridge, in the northeastern portion of Los Angeles County.

General plans, the primary document that establishes local land use policies and goals, are prepared by the counties and incorporated cities within the district. These general plans establish local policies related to aesthetics and the preservation of scenic resources within their communities or subplanning areas, and may include local scenic highway programs.

1.~~5~~4.2 Air Quality

It is the responsibility of the SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, (CO), nitrogen dioxide (NO_2), PM10, PM2.5, sulfur dioxide (SO_2), and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM10 and SO_2, far more stringent. California has also established standards for sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride.

SCAQMD also has a general responsibility pursuant to HSC §41700 to control emissions of air contaminants and prevent endangerment to public health. Additionally, state law requires the SCAQMD to implement airborne toxic control measures (ATCM) adopted by CARB, and to implement the Air Toxics "Hot Spots" Act. As a result, the SCAQMD has regulated pollutants other than criteria pollutants such as TACs, greenhouse gases and stratospheric ozone depleting compounds. The SCAQMD has developed a number of rules to control non-criteria pollutants from both new and existing sources. These rules originated through state directives, CAA requirements, or the SCAQMD rulemaking process.

Two inventories are prepared for the ~~Draft~~ 2012 AQMP for the purpose of regulatory and SIP performance tracking and transportation conformity: an annual average inventory, and a summer planning inventory. The ~~Draft~~ 2012 AQMP uses annual average day emissions to estimate the cost-effectiveness of control measures, to rank control measure implementation, and to perform PM2.5 modeling and analysis. The summer planning inventory emissions are developed to capture the emission levels during a poor ozone air quality season, and are used to report emission reduction progress as required by the federal and California Clean Air Acts.

Stationary sources can be divided into two major subcategories: point and area sources. Point sources are large emitters with one or more emission sources at a permitted facility with an identified location (e.g., power plants, refineries). Area sources consist of many small emission sources (e.g., residential water heaters, architectural coatings, consumer products, as well as permitted smaller sources), which are distributed across the region. The emissions from these sources are estimated using activity information and emission factors.

Mobile sources consist of two subcategories: on-road and off-road sources. On-road sources are from vehicles that are licensed to drive on public roads. Off-road sources are typically registered with the state and cannot be typically driven on public roads (construction and mining equipment, lawn and gardening equipment, ground support equipment, agricultural equipment).

In the 2008 base year model of the ~~Draft~~ 2012 AQMP, total mobile source emissions account for 60 percent of the VOC and 88 percent of the NOx emissions based on the summer planning inventory. The on-road mobile category alone contributes about 34 and 59 percent of the VOC and NOx emissions, respectively, and approximately 68 percent of the CO for the annual average inventory. For directly emitted PM2.5, mobile sources represent 39 percent of the emissions with another 10 percent due to vehicle-related entrained road dust.

Within the category of stationary sources, point sources contribute more SOx emissions than area sources. Area sources play a major role in VOC emissions, emitting about seven times more than point sources. Area sources, including sources such as commercial cooking, are the predominant source of directly emitted PM2.5 emissions (39 percent).

Demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) developed by SCAG for their 2012 RTP are used in the ~~Draft~~ 2012 AQMP. Industry growth factors for 2008, 2014, 2018, 2020, 2023, and 2030 are also provided by SCAG, and interim years are calculated by linear interpolation. Current forecasts indicate that this region will experience a population growth of 11 percent between 2008 and 2023, with a four percent increase in vehicle miles traveled (VMT); and a population growth of 16 percent by the year 2030 with an 11 percent increase in VMT.

Without any additional controls, VOC, NOx, and SOx emissions are expected to decrease due to existing regulations, such as controls on off-road equipment, new vehicle standards, and the RECLAIM programs. Due to already-adopted regulations, 2023 on-road mobile sources are expected to account for: about 16 percent of total VOC emissions compared to 34 percent in 2008; about 37 percent of total NOx emissions compared to 59 percent in 2008; and about 38 percent of total CO emissions compared to 68 percent in 2008. Meanwhile, area sources are expected to become the major contributor to VOC emissions from 35 percent in 2008 to 50 percent in 2023.

The milestone years 2008, 2014, 2019, 2023, and 2030 are the years for which emission inventories were developed as they are relevant target years under the federal CAA and the CCAA. The base year for the 24-hour PM2.5 attainment demonstration is 2008. The attainment year for the federal 2006 24-hour PM2.5 standard without an extension is 2014 and 2019 represents the latest attainment date with a full five-year extension. The 80 ppb federal 8-hour ozone standard attainment deadline is 2023, and the new 75 ppb 8-hour ozone standard deadline is 2032. A 2030 inventory will be used to approximate this latter year.

1.5~~4~~.3 Energy

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation (U.S. DOT), United States Department of Energy (U.S. DOE), and

U.S. EPA are three agencies with substantial influence over energy policies and programs. Generally, federal agencies influence transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy related research and development projects, and through funding for transportation infrastructure projects.

On the state level, the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are two agencies with authority over different aspects of energy policy and regulations. The CPUC regulates privately-owned utilities in the energy, rail, passenger transportation, telecommunications, and water fields. The CEC collects and analyzes energy-related data, prepares state-wide energy policy recommendations and plans, promotes and funds energy efficiency and renewable energy resources programs, plans and directs state response to energy emergencies, and regulates the power plant siting and transmission process.

In 2010, 71 percent of the electricity used in California came from in-state sources, while 29 percent was imported into the state. The electricity imported totaled 85,169 gigawatt hours (GWh), with 24,677 GWh coming from the Pacific Northwest, and 60,492 GWh from the Southwest. (Note: A gigawatt is equal to one million kilowatts). For natural gas in 2010, 42 percent of the natural gas used in California came from the Southwest, 22 percent from Canada, 12 percent from in-state, and 23 percent from the Rockies. Also in 2010, 38 percent of the crude oil came from in state, with 12 percent coming from Alaska, and 50 percent being supplied by foreign sources.

One of the key areas of concern in the energy sector is reducing the amount of petroleum based fuels in the district. Consumption of these fuels is a major factor in the amount of criteria pollutants in southern California. Alternative fuels play an important role in the strategy to reach attainment in the region. Renewable energy resources include: biomass, hydro, geothermal, solar and wind.

1.54.4 Hazards and Hazardous Materials

The potential for hazards exist in the production, use, storage, and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the district via all modes of transportation including rail, highway, water, air, and pipeline.

Hazard concerns are related to the risks of explosions or the release of hazardous substances or exposure to air toxics. State law requires detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of to prevent or mitigate injury to health or the environment in the event that such materials are accidentally released. Federal laws, such as the Emergency Planning and Community-Right-To-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act or SARA) impose similar requirements. These requirements are enforced by the California Emergency Management Agency (CalEMA).

In 2010, there were a total of 672 hazardous materials incidents (releases, accidents, spills, etc.) reported for Los Angeles, Orange, Riverside and San Bernardino counties, and in 2011 a total of 698 incidents were reported in these four counties. San Bernardino and Los Angeles counties accounted for the largest number of incidents, followed by Orange and Riverside counties.

1.54.5 Hydrology and Water Quality

The Federal Safe Drinking Water Act, enacted in 1974 and implemented by the U.S. EPA, imposes water quality and infrastructure standards for potable water delivery systems nation-wide. The California Safe Drinking Water Act was enacted in 1976. Potable water supply is managed through local agencies and water districts, the State Department of Water Resources (DWR), the Department of Health Services (DHS), the State Water Resources Control Board (SWRCB), the U.S. EPA, and the U.S. Bureau of Reclamation. The DWR manages the State Water Project (SWP), and compiles planning information on supply and demand within the state.

The DWR divides the state into ten hydrologic regions. Some regions contain a great deal of water, some regions are very dry and must have their water imported by aqueducts. The South Coast Air Basin lies within the South Coast Hydrologic Region. More than half of the state’s population resides in the region (about 19.6 million people or about 54 percent of the state’s population), which covers 11,000 square miles or seven percent of the state’s total land. The cities of Los Angeles, Long Beach, Santa Ana, San Bernardino, and Big Bear Lake are among the many urban areas in this section of the state. The Santa Clara, Los Angeles, San Gabriel, and Santa Ana Rivers are among the area’s hydrologic features. Most lakes in this area are actually reservoirs, made to hold imported water.

Imported sources account for approximately 75 percent of the total water used in the region. Local water resources, which include groundwater and captured surface water runoff, are fully developed and are expected to remain relatively stable in the future on a region-wide basis. Several groundwater basins in the region are threatened by overdraft conditions, increasing levels of salinity, and contamination by agricultural land to urban development, thereby reducing the land surface available for groundwater recharge. Increasing demand for groundwater may also be limited by water quality, since levels of salinity in sources currently used for irrigation could be unacceptably high for domestic use without treatment.

The SWRCB, and the nine regional water quality control boards (RWQCB), are responsible for protecting surface and groundwater supplies in California. In particular, the SWRCB establishes water-related policies and approves water quality control plans, which are implemented and enforced by the RWQCBs. Five RWQCBs have jurisdiction over areas within the boundaries of the SCAQMD. These agencies also regulate discharges to state waters through federal pre-treatment requirements enforced by the publicly owned treatment works (POTWs).

Water quality of regional surface water and groundwater resources is affected by point source and non-point source discharges occurring throughout individual watersheds. Regulated point sources, such as wastewater treatment effluent discharges, usually involve a single discharge into receiving waters. Non-point sources involve diffuse and non-specific runoff that enters receiving waters through storm drains or from unimproved natural landscaping. Within the regional Basin Plans, the RWQCBs establish water quality objectives for surface water and groundwater resources and designate beneficial uses for each identified waterbody.

Much of the urbanized areas of Los Angeles and Orange Counties are serviced by three agencies that operate large POTW facilities ~~operating~~ on the coast: the City of Los Angeles Bureau of Sanitation's Hyperion Treatment Plant in El Segundo, the City of Los Angeles Bureau of Sanitation's Terminal Island f~~F~~acility in San Pedro, ~~the Joint Outfall System of~~ the Los Angeles County Sanitation District's (LACSD) Joint Water Pollution Control Plant (JWPCP) in Carson, and the Orange County Sanitation District's (OCSD) treatment plants in Huntington Beach and Fountain Valley. These ~~three~~ facilities handle more than 70 percent of the wastewater generated in the entire region.

1.5~~4~~.6 Land Use and Planning

The district is comprised of the non-desert portion of Los Angeles County, all of Orange County, a portion of southwestern San Bernardino County, and the Salton Sea Air Basin and Mojave Desert Air Basin portions of Riverside County amounting to a jurisdiction of approximately 10,473 square miles and a population of approximately 17 million. Urban development in the district tends to cluster around a well-defined network of state and federal highways which connect the regional populations of the district with other regions in California and across the nation. While most urban development has historically been based in the coastal regions of Los Angeles County and Orange County, there has been considerable urban growth eastward to the mountain and valley regions of Riverside County and San Bernardino County.

Without a vast surplus of open space, developers in Los Angeles County and Orange County have turned to different types of housing and commercial developments, including townhouses, condominiums, apartments, and mixed-use developments that combine commercial and office uses. Older buildings are often renovated or converted to accommodate new residential or commercial uses, and land use patterns in major developed cities have generally shifted from the traditional single-use pattern to more of a mixed use approach, where residential and commercial land uses are often found adjacent to one another, or within the same building.

Much of the development in Riverside and San Bernardino Counties has taken place within unincorporated county land that both counties possess. Riverside County, in particular, has developed the Riverside County Integrated Project, which seeks to improve the quality of life for its citizens through a complementary array of development projects and programs aimed at creating a balanced and sustainable environment.

1.54.7 Noise

The federal government sets noise standards for transportation-related noise sources that are closely linked to interstate commerce, such as aircraft, locomotives, and trucks, and, for those noise sources, the state government is preempted from establishing more stringent standards. The state government sets noise standards for those transportation noise sources that are not preempted from regulation, such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies.

Environmental noise levels typically fluctuate across time of day; different types of noise descriptors are used to account for this variability, and different types of descriptors have been developed to differentiate between cumulative noise over a given period and single noise events. Individual noise events, such as train pass-bys or aircraft overflights, are further described using single-event and cumulative noise descriptors.

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The Federal Transit Administration (FTA) states that in contrast to airborne noise, ground-borne vibration is not a common environmental problem and most people consider groundborne vibration to be an annoyance that may affect concentration or disturb sleep. However, high levels of vibration may damage fragile buildings or interfere with equipment that is highly sensitive to groundborne vibration (e.g., electron microscopes).

Some land uses (residences, schools, hospitals, etc.) are considered more sensitive to ambient noise levels than others due to the amount of noise exposure and the types of activities typically involved and are assigned more stringent noise standards. A noise level of 55 to 60 decibels outdoors is the upper limit for intelligible speech communication inside a typical home. In addition, social surveys and case studies have shown that complaints and community annoyance in residential areas begin to occur at about 55 decibels.

1.~~5~~4.8 Solid and Hazardous Waste

A total of 32 Class III active landfills and two transformation facilities (e.g., waste-to-energy facilities) are located within the district with a total capacity of 116,796 tons per day and 3,240 tons per day, respectively[1]. Permit requirements, capacity and surrounding land use are three of the dominant factors limiting the operations and life of landfills in the ~~South Coast Air D~~district. Landfills are permitted by the local enforcement agencies with concurrence from CalRecycle (formerly known as the California Integrated Waste Management Board). Local agencies establish the maximum amount of solid waste that can be received by a landfill each day, and the operational life of a landfill. Landfills are operated by both public and private entities. Landfills in the district are also subject to requirements of the SCAQMD as they pertain to gas collection systems, dust and nuisance impacts.

There are no hazardous waste disposal sites within the jurisdiction of the SCAQMD. Hazardous waste generated at area facilities, which is not reused on-site, or recycled off-site, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities are the Chemical Waste Management (CWM) Kettleman Hills facility in King's County, and the Laidlaw Environmental Services (LES) facility in Buttonwillow (Kern County). Kettleman Hills is operating close to capacity, with reportedly less than one percent of capacity remaining. CMW applied to both the DTSC and the U.S. EPA to expand the facility to provide another 12-14 years of life. Buttonwillow receives approximately 900 tons of hazardous waste per day and has a remaining capacity of approximately 8,890,000 cubic yards. The expectant life of the Buttonwillow Landfill is approximately 40 years. Hazardous waste also can be transported to permitted facilities outside of California such as the U.S. Ecology Inc. facility in Beatty, Nevada or the LES facility in Lake Point, Utah.

While the DTSC has primary responsibility in the state for regulating the generation, transfer, storage and disposal of hazardous materials, DTSC may further delegate enforcement authority to local jurisdictions. In addition, the DTSC is responsible and/or provides oversight for contamination cleanup, and administers state-wide hazardous waste reduction programs. The DTSC conducts annual inspections of hazardous waste facilities. Other inspections can occur on an as-needed basis.

California Department of Transportation (Caltrans) sets standards for trucks transporting hazardous wastes in California. The regulations are enforced by the California Highway Patrol (CHP). Trucks transporting hazardous wastes are required to maintain a hazardous waste manifest. The manifest is required to describe the contents of the material within the truck so that wastes can readily be identified in the event of a spill.

[1] This repsresents the sum of the permitted capacities of the Southeast Resource Recovery Facility at 2,240 tons per day and the Commerce Refuse-To-Energy Facility at 1,000 tons per day. http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AK-0083/Detail/; http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-0506/Detail.

1.54.9 Transportation and Traffic

The southern California transportation system is a complex intermodal network that consists of roads, highways, public transit, paratransit, bus, rail, airports, seaports and intermodal terminals designed to carry both people and goods. The transportation system supports the region's economic needs, as well as the demand for personal travel.

Numerous agencies are responsible for transportation planning and investment decisions within the southern California area. SCAG helps integrate the transportation-planning activities in the region to ensure a balanced, multimodal plan that meets regional as well as county, subregional, and local goals, while each of the four counties within the jurisdiction of the SCAQMD has a Transportation Commission or Authority. These agencies are charged with countywide transportation planning activities, allocation of locally generated transportation revenues, and in some cases operation of transit services.

The existing transportation network serving the Southern California area supports the movement of people and goods. On a typical weekday in the four-county region the transportation network supports a total of approximately 420 million vehicle miles of travel (VMT) and 12 million vehicle hours of travel (VHT). Of this total, over half occur in Los Angeles County.

Much of the existing travel in the Southern California area takes place during periods of congestion, particularly during the morning (6:00 AM to 9:00 AM) and evening peak periods (3:00 PM to 7:00 PM). Congestion can be quantified as the amount of travel that takes place in delay (vehicle hours of delay or VHD), and alternately, as the percentage of all travel time that occurs in delay (defined as the travel time spent on the highway due to congestion, which is the difference between VHT at free-flow speeds and VHT at congested speeds). Regional travel time in delay represents approximately 25 percent of all daily, 30 percent of all AM peak period, and 38 percent of all PM peak period travel times.

The regional freeway and highway system is the primary means of person and freight movement for the region. This system provides for direct automobile, bus and truck access to employment, services and goods. The network of freeways and State highways serves as the backbone of the system offering very high capacity limited-access travel and serving as the primary heavy duty truck route system.

Transit use is growing in southern California. As of 2009, transit agencies in the southern California area reported 747.3 million boardings. This represents growth of nearly 20 percent in the ten years between 2000 and 2010, but only four percent growth in per capita trips due to population growth. Metrolink and Metro Rail (Los Angeles County) have seen ridership growth of six percent to eight percent per year.

1.6~~5~~ EXECUTIVE SUMMARY: CHAPTER 4 - ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Chapter 4 – Environmental Impacts and Mitigation Measures, provides a detailed review of the environmental topics that were identified in the 8/2~~1~~/12 NOP/IS where potentially significant adverse impacts were identified (see Appendix A). In addition, the evaluation of several environmental resources (land use and noise) was added to the Program EIR based on public comments. Each of the proposed control measures was evaluated to determine the environmental topics that would potentially be impacted, if the control measure or strategy was adopted. The following subsections provide a brief discussion of the potential environmental impacts and mitigation measures for each environmental category analyzed. Table 1-1 provides a summary of the impacts identified under each resource category, identifies mitigation measures that were imposed (if applicable), and identifies the remaining impacts following mitigation.

1.6~~5~~.1 Aesthetics

Subchapter 4.1 identifies the potential aesthetics impacts as a result of implementing the control measures in the 2012 AQMP.

Control measures ONRD-05, ADV-01 and ADV-02 included in the 2012 AQMP relate primarily to emission reductions through the incorporation of electrically powered trucks and locomotives. To power this equipment, catenary lines (overhead power lines) could be constructed and could potentially result in aesthetic impacts. These lines are similar to "trolley car lines" associated with electrically powered trollies and buses common in metropolitan transportation.

The areas affected by the proposed Zero and Near-Zero Emissions control measures that could result in the installation of catenary lines are expected to be located in commercial, industrial areas, and along existing transportation corridors (e.g., in areas within and adjacent to the Port of Los Angles and Port of Long Beach, along the I-710 Freeway, along the I-60 Freeway, as well as near railyards in downtown Los Angeles).

The construction and operation of the catenary or overhead power lines that could be used to power Zero and Near Zero vehicles and locomotives are not expected to be visible to any Scenic Highway or any roadway eligible as a Scenic Highway. Therefore, aesthetics impacts associated with the 2012 AQMP are less than significant.

1.6~~5~~.2 Air Quality

Subchapter 4.2 examines the secondary air pollutant emissions that could occur as a consequence of efforts to improve air quality (e.g., emissions from control equipment such as afterburners). Secondary air quality impacts are potential increases in air pollutant that occur indirectly from implementation of control measures in the ~~Draft~~ 2012 AQMP. SCAQMD evaluated all ~~Draft~~ 2012 AQMP control measures to identify those control measures that have the potential to generate secondary adverse air quality impacts. Evaluation of control methods for each control measure indicated that there are 27 control measures that could have potential secondary air quality impacts.

While implementing the ~~Draft~~ 2012 AQMP control measures is expected to reduce operational emissions, construction-related activities associated with installing or replacing equipment, for example, are expected to generate emissions from construction worker vehicles, trucks, and construction equipment. Implementation of some of the measures in the 2012 AQMP that require construction may cause significant impacts to air quality (mainly CO and PM10).

Secondary emissions from increased electricity demand, the reformulation of products (lower VOC materials), mobile sources (PZEV and ZEV vehicles), the increased use of fuels (lower fuel economy), and other miscellaneous sources (handling of greenwaste) are considered to be less than significant.

1.6~~5~~.3 Energy

Subchapter 4.3 identifies the potential energy impacts as a result of implementing stationary and mobile control measures in the 2012 AQMP. The EIR evaluated the potential impacts of the AQMP on electricity, natural gas, petroleum fuels, alternative fuels, and renewable energy.

The increase in electricity associated with the control measures and strategies in the 2012 AQMP is considered to be significant. While the increase in electricity is expected to be within the electric generating capacity of the region, an increase in electricity of greater than one percent represents a substantial increase in electricity. Thus, the energy impacts associated with electricity demand from the implementation of the 2012 AQMP are considered to be significant.

The energy impacts associated with implementation of the control measures and strategies in the 2012 AQMP are expected to result in an increase in natural gas demand. The increased demand for natural gas is considered to be significant.

The energy impacts associated with implementation of the control measures and strategies in the 2012 AQMP are expected to result in a reduction in use (less demand) of petroleum fuels so that no significant impacts on petroleum fuels are expected.

Although an increase in demand for hydrogen as a transportation fuel is expected due to implementation of the control measures and strategies in the 2012 AQMP, this increase is not expected to be significant since hydrogen is not widely available and its use is currently limited. Hydrogen is available or the feedstock that produces it is generally available. Future demand is expected be met through increased production. The energy impacts associated with the future use of hydrogen is expected to be less than the current strategy that uses predominately petroleum based fuels so that no significant hydrogen demand impacts on are expected.

The design and goal of the 2012 AQMP is to shift to less polluting transportation fuels. Although an increase in alternative transportation fuels is expected, this increase is not expected to be significant since alternative fuels (e.g., natural gas or hydrogen) are available or the feedstock that produces the fuels is generally available.

Finally, no 2012 AQMP control measures were identified that would adversely affect renewable energy production or interfere with the goals and requirements of the Renewables Portfolio Standard.

1.6~~5~~.4 Hazards and Hazardous Materials

Subchapter 4.4 identifies the potential hazard impacts as a result of implementing the control measures in the ~~Draft~~ 2012 AQMP. The Initial Study identified the following types of control measures as having potentially significant hazards impacts: 1) use of reformulated coatings, solvents, adhesives, mold release and consumer products; 2) increase in the transportation and disposal of reformulated products; 3) the use of ammonia in selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) air pollution control technology; and, 4) use of alternative fuels.

Each control measure in the ~~Draft~~ 2012 AQMP was evaluated for potential hazard and hazardous materials impacts based the technologies expected to be employed through implementation of the control measure. Evaluation of control methods for each control measure indicated that there are 24 (three PM2.5 and 21 ozone precursor) control measures that have potential adverse hazard impacts.

Control Measures MCS-01, CTS-01, CTS-02, CTS-03, and CTS-04 could require reformulation of coatings, adhesives, solvents, mold release, and consumer products. The analysis indicates that the fire hazard impacts associated with reformulation are expected to be significant. Mitigation measures HZ-1 and HZ-2 were imposed that would add consumer warning requirements for all flammable and extremely flammable products and require public education regarding the use of flammable materials are expected to reduce the impacts to less than significant.

Control Measures IND-01, INC-01, ONRD-01, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07 would establish in-use strategies that may require or promote the use of alternative fuels. Hazards impacts from the increased use of alternative fuels (including methanol, ethanol, CNG, LPG, biodiesel, hydrogen and electric/hybrid) are expected to be similar to or less than hazards associated with conventional fuels. Therefore, significant hazard impacts are not expected from the increased use of these alternative fuels. The potential hazards associated with the transportation of LNG were determined to be significant and mitigation measures HZ-3 through HZ-6 were imposed. However, the mitigation measures would not reduce LNG transport impacts to less than significant.

Control Measures CMB-01, IND-01, MSC-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-04, and ADV-05 could result in the use of SCR and SNCR to reduce NOx emissions. While the use of aqueous ammonia at concentrations less than 20 percent by volume is expected to reduce hazard impacts associated with ammonia use, the potential for a spill of aqueous ammonia during transportation or on-site could pose a significant hazards impact. Accordingly, significant hazard impacts are expected from the increased use of ammonia in SCR and SNCR technologies and mitigation measures HZ-7 through HZ-10 were imposed that required the use of aqueous ammonia and included containment devices. After mitigation, no remaining significant impacts associated with ammonia use is expected.

Some control measures in the 2012 AQMP could use fuel additives in conjunction with other technologies and methodologies to provide emission reductions. In the past, the introduction of fuel additives into fuels has resulted in environmental impacts (e.g., lead and MTBE). Because of the many requirements before additives can be approved for use, the potential impacts of fuel additives are less than significant because negative impacts would be identified and mitigated, as necessary, prior to their use. Therefore, no mitigation measures are required.

Finally, no hazard impacts were identified pertaining to safety issues associated with implementing MCS-03, Start-up, Shutdown and Turnaround Procedures or from other control measures that would increase the use of catalysts.

1.6~~5~~.5 Hydrology and Water Quality

Subchapter 4.5 identifies potential hydrology and water quality impacts that may be generated by implementing the 2012 AQMP. Some of the control measures in the 2012 AQMP may result in impacts on water quality and increased wastewater discharge; water quality impacts associated with the use of alternative fuels; water quality impacts associated with increased use of batteries; increased water demand; and use and application of sodium bisulfate for livestock operations.

Wastewater treatment facilities are expected to have sufficient capacity to handle the estimated increase in wastewater that could be generated from reformulation of products and use of air pollution control equipment (e.g., wet ESPs and WGSs). Therefore, no significant impacts associated with wastewater treatment or water quality is expected.

The use of alternative fuels is not expected to result in greater adverse water quality impacts than the use of conventional fuels. No significant adverse hydrology and water quality impacts are expected from the increased use of alternative fuels.

It is expected that the recycling of EV and hybrid batteries will be greater than lead-acid batteries in conventional vehicles, reducing the potential for illegal disposal and potential water quality impacts. No significant adverse water quality impacts are expected from the increased use of EV and hybrid vehicles.

Water demand associated with the manufacture and use of waterborne and add-on air pollution control technologies are potentially significant. While mitigation measures are available, they can vary from jurisdiction to jurisdiction, and may remain significant.

The use and application of SBS should be controlled and monitored to prevent water quality runoff and related water quality impacts. Therefore, the use of SBS is expected to be less than significant.

Potential spills associated with ammonia are expected to be contained on-site due to the requirement for secondary spill containment devices and berms. Therefore, potential ammonia spills are expected to be less than significant.

1.6~~5~~.6 Land Use and Planning

Subchapter 4.6 examines the potential land use impacts associated with implementation of the proposed control measures in the 2012 AQMP. Potential land use impacts are associated primarily with the construction of support systems (e.g., catenary overhead electrical lines or magnetic infrastructure related to operation of zero- and near-zero transport systems). Control measures ONRD-05, ADV-01, and ADV-02 could require construction activities that may generate land use impacts. Control measures are not expected to conflict with applicable land use plans, policies, or regulations or physically divide an established community. Therefore, no significant adverse land use impacts are expected.

1.6~~5~~.7 Noise

Subchapter 4.7 identifies 2012 ~~Draft~~ AQMP control measures that could result in potential adverse noise impacts. Control measures that may have noise impacts relate primarily with construction activities associated with air pollution control equipment and construction of support systems (e.g., wayside power, catenary overhead electrical lines, battery charging or fueling infrastructures related to operation of zero- and near-zero transport systems).

A number of control measures could result in the construction of air pollution control equipment including BCM-03, IND-01, MCS-01, CMB-01, FUG-01, FUG-02, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06. Control measures ONRD-05 and ADV-01 could require the installation of catenary overhead electrical lines within or adjacent to existing roadways, streets, freeways, and/or transportation corridors. ADV-02 could require the installation of electrical or magnetic infrastructure along rail lines.

During construction, there may be significant noise and vibration impacts, but these will be temporary in nature and related solely to construction activities. No modification to existing rail or truck traffic routes/corridor is expected; therefore, noise and vibration impacts associated with operational activities are expected to be less than significant.

1.6~~5~~.8 Solid and Hazardous Waste

Subchapter 4.8 identifies potential solid and hazardous waste impacts that may be generated by implementing the ~~Draft~~ 2012 AQMP. Implementing some of the control measures could increase the generation and disposal of solid and hazardous waste in the region. Specifically, some control measures will encourage the use of electric vehicles which could result in an increase in waste associated with spent batteries (Control Measures IND-01, INC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06). Other control measures could increase the generation of solid or hazardous waste due to installation of air pollution control equipment, such as activated carbon, filters, and catalysts (Control Measures BCM-03, MCS-01, CMB-01, INC-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-04, and ADV-05). Finally, other control measures would encourage the early retirement of older equipment and replacement with newer and lower emission technology equipment, generating additional waste (Control Measures IND-01, MCS-01, CMB-01, CMB-02, CMB-03, INC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, ADV-01, ADV-02, ADV-05, ADV-06, and ADV-07).

The increased use of EVs and hybrids are not expected to result in a significant increase in the illegal disposal of batteries as they are valuable as a recyclable; no significant solid and hazardous waste impacts were identified due to air pollution control technologies as part of the ~~Draft~~ 2012 AQMP; and control measures that would require new equipment are not expected to result in a significant impact as the equipment being replaced can be reused in areas outside the district or recycled.

1.6~~5~~.9 Transportation and Traffic

Subchapter 4.9 examines impacts on the potential transportation and traffic impacts associated with implementation of the proposed control measures in the 2012 AQMP. Some of the control measures could require construction activities adjacent to or within existing roadways potentially impacting traffic during construction activities.

The existing rail and truck routes/corridors likely to be modified are located primarily in commercial and industrial zones within the Southern California area. Examples of these areas include, but are not limited to, the Port of Los Angeles, Port of Long Beach, and industrial areas in and around container transfer facilities (rail and truck) near the Terminal Island Freeway, along the Alameda Corridor, as well as inland facilities. Since only existing transportation routes will be modified, no new transportation routes are anticipated as part of the proposed project, project impacts will be temporary in nature and limited to construction activities.

Implementation of Control Measures ONRD-05 and ADV-01 may contribute to significant adverse operational traffic impacts on roadways because transportation infrastructure improvements pertaining to overhead catenary electrical lines could require the dedication of an existing land exclusive to vehicles using the overhead catenary electrical lines. The dedication of an existing lane would mean that other vehicles would have reduced access to available driving lanes, which could adversely affect traffic and congestion. Mitigation measures for construction and operation would need to be identified on a project-by-project basis. SCAQMD recommends that mitigation measure MM-TR29 from SCAG's 2012-2035 RTP/SCS Program EIR (which generally requires a traffic management plan) be implemented for all projects resulting from Control Measures ONRD-05 and/or ADV-01 that have the potential to impact roadways. Traffic impacts would remain significant after mitigation.

1.6~~5~~.10 Other CEQA Topics

1.6~~5~~.10.1 Growth-Inducing Impacts

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. The 2012 AQMP is not expected to foster economic or population growth or result in the construction of additional housing or other infrastructure, either directly or indirectly, that would further encourage growth. The 2012 AQMP could result in construction projects at existing stationary sources and along existing transportation corridors. However, the proposed project would not be considered growth-inducing, because it would not result in an increase in production of resources or cause a progression of growth that could significantly affect the environment either individually or cumulatively.

1.6~~5~~.10.2 Significant Environmental Effects Which Cannot Be Avoided

The following is a summary of impacts associated with the 2012 AQMP that this ~~Draft~~ Final Program EIR concluded are significant and unavoidable:

- Air emissions associated with construction activities due to the implementation of the control measures in the 2012 AQMP were considered to be potentially significant for CO and PM10 emissions.

- The increased demand for electricity and natural gas associated with the 2012 control measures is considered to be significant.

- The potential hazards associated with LNG transport are considered significant.

- Water demand associated with the manufacture and use of waterborne coatings, solvents and other consumer products, and add-on air pollution control technologies are potentially significant. While mitigation measures as available, they can vary from jurisdiction to jurisdiction, and may remain significant.

- Noise and vibration impacts will be temporary in nature and related solely to construction activities, but could be significant.

- Traffic impacts will be temporary in nature and related solely to construction activities, but could be significant.

Feasible mitigation measures have been developed for the identified adverse significant impacts; however, those mitigation measures may not reduce the impacts to less than significant. The 2012 AQMP would place only an incremental demand on nonrenewable and limited resources, such as energy and water supplies relative to the rate of use of these resources due to population growth and increased consumer demand. The largely irretrievable conversion of undeveloped/agricultural land to urban uses is a function of the growing population and local land use authority, not the 2012 AQMP. The 2012 AQMP is expected to result in long-term benefits associated with achieving ambient air quality standards and a reduction in the use of petroleum-based fuels (e.g., increased use of alternative fuels).

1.6~~5~~.10.3 Relationship Between Short-Term Uses and Long-Term Productivity

Implementing the ~~Draft~~ 2012 AQMP is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. The purpose of the 2012 AQMP is to set forth a comprehensive control program that will lead the Basin into compliance with the federal 24-hour PM2.5 air quality standards and achieve additional reductions in ozone precursors. By attaining federal and state air quality standards, the 2012 AQMP is expected to enhance short and long-term environmental productivity in the region.

1.7~~6~~ EXECUTIVE SUMMARY: CHAPTER 5 – CUMULATIVE IMPACTS

CEQA Guidelines §15130 (a) requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in §15065 (a)(3). The 2012 AQMP is a regional plan that includes broad policy criteria and as such, the 2012 AQMP Final Program EIR evaluates the environmental impacts associated with implementing the 2012 AQMP stationary and mobile source control measures to determine whether or not the impacts of the project are cumulatively considerable when combined with potential impacts associated with other similar regional projects involving regulatory activities or other projects with similar impacts.

The traffic control measures (TCMs) in the 2012 AQMP (see Appendix E of this Final Program EIR) were developed and adopted by SCAG as part of the 2012-2035 RTP/SCS and the 2011 Federal Transportation Improvement Program (FTIP). These measures and recommendations have accordingly been moved forward for inclusion in the region's air quality plans and are included as part of the 2012 AQMP. The impacts of implementation of these TCMs were evaluated in the 2012-2035 RTP/SCS Program EIR (SCAG, 2012). The cumulative analysis in this section of the Final Program EIR for the 2012 AQMP relies primarily on the environmental analyses in the SCAG 2012-2035 RTP/SCS Program EIR for the evaluation of the environmental impacts of implementing the TCMs.

Because the TCMs, their associated mitigation measures, and their emissions reductions are included along with the 2012 AQMP in the PM2.5 SIP submittal for the Basin and because the TCMs and other projects in the 2012-2035 RTP/SCS have the potential to generate similar impacts, the 2012-2035 RTP/SCS is considered to be a cumulatively related project. In general, the long-term transportation planning requirements for emission reductions from on-road mobile sources within the district are met by SCAG's RTP/SCS, whereas the short-term implementation requirements of the Transportation Conformity Rule are met by SCAG's biennial Regional Transportation Improvement Program (RTIP).

1.7~~6~~.1 Aesthetics

Implementation of the 2012 AQMP would not in itself result in significant aesthetic impacts.

According to the 2012-2035 RTP/SCS Program EIR, aesthetic impacts are expected to remain significant because it is likely that there will be situations where visual impacts cannot be mitigated to a less than significant level. Aesthetic impacts would remain significant because the population growth projected by 2035 in combination with the projects in the 2012-2035 RTP/SCS would consume currently vacant land that would create significant contrasts with the overall visual character of the existing landscape setting. Potential aesthetic resources impacts would be reduced following the implementation of mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation.

There is no overlap between the 2012 AQMP projects that may affect aesthetics resources and aesthetic resources impacts created by the 2012-2035 RTP/SCS. The 2012 AQMP would not contribute to aesthetic impacts as noted above, so adverse cumulative operational aesthetics resources impacts are concluded to be less than significant.

1.7~~6~~.2 Agricultural Resources

The 2012 AQMP is not expected to result in significant agriculture resources impacts, as evaluated in the NOP/IS.

For the 2012-2035 RTP/SCS, agricultural resource impacts are expected to remain significant following mitigation as the 2012-2035 RTP/SCS is expected to contribute to the loss and disturbance of agricultural lands as up to 74,300 new lane miles could be developed, some of which could disturb or consume agricultural lands. Potential agricultural resources impacts associated with the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of the 2012-2035 RTP/SCS would contribute to significant loss and disturbance of agricultural lands. Moreover, the 2012 AQMP would not contribute to these impacts, so adverse cumulative operational agricultural resources impacts are concluded to be less than significant.

1.7~~6~~.3 Air Quality

Construction Impacts: Construction activities associated with the 2012 AQMP would result in significant impacts to the air quality resource and any concurrent emissions-generating activities from reasonably foreseeable construction activities would add an additional air emission burden to these significant levels. Therefore, construction air quality impacts from the 2012 AQMP are considered to be cumulatively considerable prior to mitigation and would contribute to significant adverse cumulative impacts from the 2012-2035 RTP/SCS.

Operational Impacts – Criteria Pollutants: The 2012 AQMP would result in overall emission reductions of NOx, VOC, SOx, and PM emissions, providing an air quality benefit. The 2012 AQMP would attain the 24-hour federal PM2.5 standard by 2014, make progress towards attaining the eight-hour ozone standard, maintain compliance with state and federal NO_2 standards, maintain compliance with state and federal SO_2 standards, and maintain compliance with the federal 24-hour PM10 standard. Secondary emissions from increased electricity demand, control of stationary sources, increased use of reformulated products, mobile sources, increased use of fuels due to reduction in fuel economy, and from miscellaneous sources were considered to be less than significant.

Under the 2012-2035 RTP/SCS, mobile source criteria pollutant emissions would stay approximately the same or decrease, providing an air quality benefit. However, the increase of re-entrained roadway dust would increase proportionately to VMT and as such was considered a significant impact.

Implementation of the 2012 AQMP would not in itself result in significant adverse operational air quality impacts associated with operational activities. For this reason, the 2012 AQMP would not be expected to contribute to significant adverse cumulative impacts from transportation projects projected in the 2012-2035 RTP/SCS.

Operational Impacts – Non-Criteria Pollutants: The 2012 AQMP is expected to result in a reduction of toxic air contaminant (TAC) emissions. The basis for this conclusion is that many TACs are also classified as criteria pollutants (e.g., PM and

VOCs). To the extent that AQMP control measures reduce PM and VOC emissions, associated TAC emission reductions could occur as well. The overall impacts associated with implementation of the 2012 AQMP are an overall reduction in non-criteria pollutants (e.g., toxic air contaminants). Therefore, no significant impacts on non-criteria pollutants have been identified.

Under the 2012-2035 RTP/SCS, as a result of on-going emission controls, cancer and other health risks within any given distance of mobile sources in the region would decline, although the health risks adjacent to transportation facilities would remain higher than regional averages and above desirable levels. As a result of 2012-2035 RTP/SCS policies anticipated growth patterns would concentrate population adjacent to transit and other transportation facilities in High Quality Transit Areas (HQTAs) that could result in more people being exposed to elevated cancer risk as compared to areas of the region more distant from such facilities.

Implementation of the 2012 AQMP would not in itself result in significant air quality impacts associated with non-criteria pollutants. Moreover, the 2012 AQMP would not contribute to impacts associated with transportation projects projected in the 2012-2035 RTP/SCS and, therefore, would not be expected to contribute to a cumulatively considerable impact requiring mitigation.

Greenhouse Gas Impacts: The 2012 AQMP is expected to result in a reduction of GHGs. This conclusion is based on the fact that mobile source control measures would reduce GHG emissions through accelerated penetration of partial zero-emission and zero emission vehicles, the use of alternative fuels such as natural gas, the combustion of which generates less GHG emissions than diesel fuel, along with other energy efficiency and pollution prevention measures.

Implementation of the 2012-2035 RTP/SCS projects would result in a significant increase of greenhouse gas emissions from residential and commercial building construction, operational energy demand, and total mobile source emissions. The 2012-2035 RTP/SCS Program EIR concludes that implementation of 2012-2035 RTP/SCS projects would meet the applicable AB 32 reduction targets (identified in SB 375) with respect to light duty vehicles. However, without technical details as to how each sector of the economy would comply with AB 32, growth anticipated to occur under the 2012-2035 RTP/SCS could result in a significant impact related to AB 32 and the Scoping Plan.

The 2012-2035 RTP/SCS Program EIR concluded that because per capita carbon dioxide emissions from light duty trucks and autos would meet ARB targets by 2020 and would achieve even greater emission reductions in 2035, the 2012-2035 RTP/SCS would result in a less-than-significant impact related to per capita emissions and SB 375.

Air Quality Summary: The air quality impacts associated with 2012 AQMP control measures were determined to be significant for construction activities and less than significant for secondary emissions from increased electricity demand, control of stationary sources, change in use of lower VOC materials, mobile sources, increase use of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone. Although mitigation measures identified in the 2012 AQMP Final Program EIR would reduce construction air quality impacts associated with construction activities, impacts would remain significant and as such would continue to contribute to considerable impacts following mitigation. Since project-specific construction air quality impacts from the 2012 AQMP would be significant, the 2012 AQMP would contribute to significant adverse cumulative construction air quality impacts generated by the 2012-2035 RTP/SCS

Similarly, although mitigation measures identified in the 2012-2035 RTP/SCS Program EIR would reduce air quality and associated health impacts, impacts for construction, operation, TACs, and GHG impacts would continue to contribute to cumulatively considerable impacts following mitigation. The 2012 AQMP would not contribute to these impacts, so adverse cumulative operational air quality impacts are concluded to be less than significant.

1.7~~6~~.4 Biological Resources

The 2012 AQMP is not expected to result in significant biological resources impacts. 2012-2035 RTP/SCS impacts associated with biological and open space resources would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation due to significant disturbance and removal of natural vegetation that may be utilized by sensitive species, habitat fragmentation and the associated decrease in habitat quality, litter, trampling, light pollution and road noise in previously undisturbed natural areas, displacement of riparian and wetland habitat, siltation of streams and other water bodies during construction, and the loss of prime farmlands, grazing lands, open space and recreation lands. The increased urban development anticipated by the 2012-2035 RTP/SCS would also result in similar impacts. However, since the 2012 AQMP was not identified as creating any adverse biological resources impacts, it would not create cumulatively considerable impacts, so adverse cumulative biological resources impacts from the 2012 AQMP are concluded to be less than significant.

1.7~~6~~.5 Cultural Resources

The 2012 AQMP is not in itself expected to result in significant cultural resources impacts. The development of transportation facilities as part of the 2012-2035 RTP/SCS may affect historical resources because many projects could be located in older urban centers where structures of architectural of historical significance are likely to be located. In addition, 2012-2035 RTP/SCS transportation projects would significantly affect archaeological and paleontological resources because projects could be located in previously undisturbed areas. However, the 2012 AQMP would not contribute to impacts associated with transportation projects projected in the 2012-2035 RTP/SCS and, therefore, would not be expected to contribute to a cumulatively considerable impact requiring mitigation. As a result, adverse cumulative cultural resources impacts from the 2012 AQMP are concluded to be less than significant.

1.7~~6~~.6 Energy

Electricity and natural gas demand impacts associated with the 2012 AQMP control measures were concluded to be significant, while energy impacts associated with use of petroleum fuels, use of alternative fuels and renewable energy sources were considered to be less than significant. Although mitigation measures identified in the 2012 AQMP Final Program EIR would reduce energy impacts associated with electricity demand, impacts would remain significant and as such would continue to contribute to considerable impacts following mitigation.

2012-2035 RTP/SCS impacts associated with energy resources would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because energy consumed during construction and expansion of the transportation system, as well as growth that would be accommodated by the 2012-2035 RTP/SCS, would contribute to considerable impacts following mitigation. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would contribute to a cumulatively considerable electricity and natural gas demand impacts following mitigation.

1.7~~6~~.7 Geology and Soils

Implementation of the 2012 AQMP would not in itself result in significant geological or soil impacts. Potential geologic and soil resources impacts associated with the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of the 2012-2035 RTP/SCS is expected to result in potential damage to transportation infrastructure through surface rupture, ground shaking, liquefaction, and landsliding, as well as long term soil erosion and/or loss of top soil, subsidence, and slope failure. Moreover, the 2012 AQMP would not contribute to geologic and soil resources impacts associated with transportation projects projected in the 2012-2035 RTP/SCS and, therefore, would not be expected to contribute to a cumulatively considerable impact requiring mitigation.

1.7~~6~~.8 Hazards and Hazardous Materials

It was concluded in the 2012 AQMP Final Program EIR that potentially significant adverse fire hazard impacts associated with reformulated products and the on-site ammonia storage hazards would be less than significant after mitigation. In spite of implementing mitigation measures, it was concluded that hazards associated with LNG transport would remain significant.

It was concluded in the 2012-2035 RTP/SCS that impacts associated with hazards and hazardous materials would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, impacts from the implementation of the 2012-2035 RTP/SCS, associated with upset and accident conditions, hazardous emissions in vicinity of schools, and disturbance of contaminated property during construction activities would remain significant following mitigation. When combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, the 2012 AQMP has the potential to contribute to a cumulatively considerable hazards and hazardous materials impacts following mitigation for the risks associated with the transport of LNG.

1.7~~6~~.9 Hydrology and Water Quality

Although 2012 AQMP impacts associated with water demand would be reduced following the implementation measures, the effectiveness of mitigation measures can vary between jurisdictions, therefore, water demand impacts may remain significant.

2012-2035 RTP/SCS impacts associated with hydrology and water quality would be reduced following the implementation of the 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation for water quality, wastewater, riparian habitats and waters of the U.S. runoff/drainage, groundwater, flooding, and water supply. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would contribute to cumulatively considerable impacts following mitigation to water demand impacts. The cumulative impacts of other hydrology and water quality impacts associated with the 2012 AQMP are less than significant.

1.7~~6~~.10 Land Use and Planning

Implementation of the 2012 AQMP would not result in any significant impacts associated with land use or planning. Potential land use and planning impacts associated with the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of the 2012-2035 RTP/SCS would contribute to inconsistencies with general plans, disruption or division of established communities, changes to land uses by changing concentrations of development throughout SCAG, change patterns of growth and urbanization beyond the SCAG region, and cumulatively considerable changes to land use and the intensity of land use. Short-term construction related impacts and long-term or permanent displacement or offsite impacts from new facilities would also potentially occur as a result of implementation of the 2012-2035 RTP/SCS. Moreover, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would not be expected to contribute to cumulatively considerable land use and planning impacts requiring mitigation.

1.7~~6~~.11 Mineral Resources

Implementation of the 2012 AQMP would not result in any significant impacts associated with mineral resources. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of 2012-2035 RTP/SCS would result in increased demand driven by growth and the large number of projects anticipated in the 2012-2035 RTP/SCS. The 2012 AQMP, when combined with past, present, and reasonably foreseeable activities and in particular with the 2012-2035 RTP/SCS transportation projects, would not be expected to contribute to cumulatively considerable mineral resources impacts following mitigation.

1.7~~6~~.12 Noise

The 2012 AQMP control measures associated with construction of overhead catenary lines could result in significant noise and vibration impacts after mitigation due to the geographic proximity of sensitive receptors. Although impacts would be reduced following implementation of noise mitigation measures identified in the 2012 AQMP Final Program EIR, noise and vibration impacts associated with the construction of catenary lines would remain significant in areas where sensitive receptors are located near transportation corridors.

2012-2035 RTP/SCS impacts associated with noise would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation for noise and vibration during construction activities and operational activities. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would contribute to cumulatively considerable construction noise and vibration impacts following mitigation.

1.7~~6~~.13 Population and Housing

The 2012 AQMP control measures would not result in population and housing impacts. The policies included in the 2012-2035 RTP/SCS seek to direct growth in a way that is efficient for both mobility and land consumption. Implementation of the RTP/SCS would help induce growth to certain vacant areas of the region, a substantial number of residences and businesses would likely be displaced, and the mobility benefits from the RTP/SCS may shift population, households, and employment. This may generate potentially significant adverse cumulative population and housing impacts in spite of implementing mitigation measures. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and with 2012-2035 RTP/SCS projects in particular, would not be expected to produce a cumulatively considerable impact following mitigation.

1.7~~6~~.14 Public Services

The 2012 AQMP control measures would not result in significant public services impacts. The public service impacts from the 2012-2035 RTP/SCS associated with police, fire, and emergency response were concluded to be significant in spite of implementing mitigation measures. Impacts to wildfire threats would also remain significant because development would occur in areas that have a high threat of fire. In addition, the region's demand to accommodate an additional 453,000 school children would remain a significant impact on public services following implementation of 2012-2035 RTP/SCS mitigation measures.

Based on the above information, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and with 2012-2035 RTP/SCS projects in particular, is not expected to produce cumulatively considerable impacts to public services following mitigation.

1.7~~6~~.15 Recreation

The 2012 AQMP control measures would not result in significant impacts on recreation resources. Impacts associated with recreation resources remain significant following mitigation because the 2012-2035 RTP/SCS would contribute to the loss and disturbance of open space and recreational lands. Based on the above information, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would not be expected to contribute to cumulatively considerable recreation impacts following mitigation.

1.7~~6~~.16 Solid and Hazardous Waste

The 2012 AQMP control measures would not result in significant impacts on solid or hazardous waste. Solid and hazardous waste impacts associated with the 2012-2035 RTP/SCS would remain significant following mitigation because the demand for solid waste services in the SCAG region and the resulting need to move solid waste large distances, potentially out of the region, would remain. Based on the above information, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would not be expected to contribute to cumulatively considerable solid or hazardous waste impacts following mitigation.

1.7~~6~~.17 Transportation and Traffic

The 2012 AQMP control measures that could result in the construction of overhead catenary lines are expected to remain a significant construction impact to traffic after mitigation. Such construction activities would generate traffic associated with construction worker vehicles and trucks delivering equipment, materials and supplies to the project site during the duration of the construction activities. Similarly, transportation infrastructure improvements pertaining to overhead catenary electrical lines could require the dedication of an existing lane exclusive to vehicles using the overhead catenary electrical lines or fixed guideway systems. Thus, a reduction in the number of available lanes could result in significant adverse operational traffic impacts.

According to the 2012-2035 RTP/SCS Program EIR, implementation of the RTP/SCS would result in several significant and several less than significant impacts after mitigation. The 2035 VMT and 2035 heavy-duty truck VHD would be substantially greater than the existing conditions and as such would result in a significant impact in spite of implementing mitigation measures. As the population increases through 2035, the number of trips originating and ending in Santa Barbara, San Diego and Kern counties to and from the SCAG region would increase. And the transportation demand from growth, in combination with the accommodating projects in the 2012-2035 RTP/SCS would contribute to a cumulatively considerable transportation impact.

Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and with 2012-2035 RTP/SCS projects in particular, would contribute to cumulatively considerable construction impacts following mitigation and, since no mitigation measures were identified that reduce potential operation-related traffic impacts, these remain significant.

1.8~~7~~ EXECUTIVE SUMMARY: CHAPTER 6 – ALTERNATIVES

1.8~~7~~.1 Alternatives Evaluated in the Program EIR

Four alternatives were evaluated in the Program EIR. The following provides a description of each alternative.

Alternative 1, No Project: CEQA requires the specific alternative of no project to be evaluated. A No Project Alternative consists of what would occur if the project was not approved; in this case, not adopting the ~~Draft~~ 2012 AQMP. The net effect of not adopting the ~~Draft~~ 2012 AQMP would be a continuation of implementing the 2007 AQMP.

Alternative 2, PM2.5 Attainment Plan Localized PM Control in Mira Loma Area: This alternative is similar to the currently proposed ~~Draft~~ 2012 AQMP with the following exception. Alternative 2 does not include Control Measure BCM-02. Instead, Alterative 2 includes the same episodic control measures that would apply only to the Mira Loma area as described in the June 28, 2012 NOP/IS. These control measures would be implemented sequentially and as needed to meet the 24-hour PM2.5 standard at the Mira Loma monitoring station.

Alternative 3, Greater Reliance on NOx Emissions Reductions: This alternative would rely to a greater extent on NOx emission reductions, primarily from on-road and off-road mobile sources to achieve the federal 24-hour PM2.5 standard.

Alternative 3 includes all of the same ozone control measures as the ~~Draft~~ 2012 AQMP, but Control Measures ONRD-03 and OFFRD-01 would be modified under Alternative 3 to accelerate implementation of CARB's on-road and off-road regulations, respectively.

Alternative 4, PM2.5 Emissions Reduction Strategies Only: This alternative is considered to be a legally viable alternative because the SCAQMD is only required to submit a PM2.5 plan demonstrating attainment of the 2006 24-hour PM2.5 National Ambient Air Quality Standard no later than three years from December 14, 2012, the effective date of designation of nonattainment of the federal 24-hour PM2.5 standard. However, there is no federal requirement to submit an ozone plan by the same date as the PM2.5 plan. Alternative 4 would only include Control Measures CMB-01, BCM-01, BCM-02, BCM-03, BCM-04, IND-01, EDU-01, and MCS-01, eschewing all the other CAA §182 (e)(5) control measures, but continue implementing the Ozone SIP portion of the 2007 AQMP.

1.8~~7~~.2 Alternatives Analysis Summary

Of the project Alternatives, Alternative 1 would generate the least amount or least severe environmental impacts compared to the 2012 AQMP. However, of the project alternatives it would achieve the fewest of the project objectives.

Alternative 2 would be expected to generate equivalent impacts to the 2012 AQMP in all environmental topic areas analyzed. It would achieve all of the project objectives, but would not achieve the objectives related to reducing PM2.5 emissions as well as the 2012 AQMP.

Alternative 3 has the potential to generate greater impacts than the 2012 AQMP because Alternative 3 ozone Control Measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (1,000 trucks per year, 250 trucks per year (1,250 total trucks) would comply with the 2010 on-road vehicle exhaust requirements using CNG engines and the rest would be diesel or diesel hybrid). Similarly, Alternative 3 OFFRD-01 could result in a total of 19,344 additional repowered vehicles from the year 2014 through 2017. To the extent that these ozone control measures contribute to environmental impacts, they would be greater than environmental impacts from the 2012 AQMP. Consequently, Alternative 3 does meet the requirement to reduce environmental impacts compared to the proposed project.

Alternative 4 would generate fewer environmental impacts or less severe impacts than the 2012 AQMP. It would achieve all but four of the project objectives (e.g., those related to continued progress towards attaining the ozone standards).

Based on the above information, the 2012 AQMP is the most effective project that provides the best balance in achieving all of the project objectives relative to environmental impacts generated.

TABLE 1-1

Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
AESTHETICS		
Potential visual impacts and impacts to scenic highways due to overhead power lines.	None required since no significant impacts were identified.	Impacts are expected to be less than significant.
AIR QUALITY		
Construction-related activities associated with installing or replacing equipment are expected to generate emissions from construction worker vehicles, trucks, and construction equipment. The secondary impacts associated with construction activities are potentially significant for CO and PM10 emissions.	Develop a Construction Emission Management Plan for the proposed project. The Plan shall include measures to minimize emissions from vehicles including, but not limited to consolidating truck deliveries, prohibiting truck idling in excess of five minutes, description of truck routing, description of deliveries including hours of delivery, description of entry/exit points, locations of parking, and construction schedule. At a minimum the Construction Emission Management Plan will include the following mitigation measures: 1) Prohibit construction equipment from idling longer than five minutes at construction sites; 2) Maintain construction equipment tuned up to manufacturer's recommended specifications that optimize emissions without nullifying engine warranties; 3) Electric welders shall be used in all construction areas that are demonstrated to be served by electricity; 4) Onsite electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity; 5) Use cranes rated 200 hp or greater equipped with Tier 3 or equivalent engines; 6) For off-road construction equipment rated 50 to 200 hp that will be operating for eight hours or more, the project proponent shall use equipment rated 50 to 200 hp equipped with Tier 3 or equivalent engines; and 7) Suspend use of all construction activities that generate air pollutant emissions during first stage smog alerts.	The emissions associated with construction activities from the ~~proposed Draft~~ 2012 AQMP control measures were considered to be significant for CO and PM10 emissions.
Secondary impacts from increased electricity demand are less than significant.	None required since no significant impacts were identified.	Impacts are expected to be less than significant.

TABLE 1-1 (CONTINUED)

Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
AIR QUALITY (cont.)		
Secondary impacts from control of stationary sources are less than significant.	None required since no significant impacts were identified.	Secondary air quality impacts from stationary sources are expected to be less than significant.
Secondary impacts from change in use of lower VOC materials are less than significant.	None required since no significant impacts were identified.	Secondary air quality impacts from use of lower VOC products are expected to be less than significant.
Secondary impacts from mobile sources are less than significant.	None required since no significant impacts were identified.	Secondary air quality impacts from mobile sources are expected to be less than significant.
Secondary impacts from miscellaneous sources are less than significant.	None required since no significant impacts were identified.	Secondary impacts from miscellaneous sources are expected to be less than significant.
The impacts associated with toxic air contaminants were determined to be less than significant.	None required since no significant impacts were identified.	Toxic air contaminant impacts are expected to be less than significant.
Implementation of the control measures in the ~~Draft~~ 2012 AQMP is expected to reduce emissions of compounds that contribute to global warming and ozone. GHG impacts are less than significant.	None required since no significant impacts were identified.	GHG emission impacts are expected to be less than significant.
ENERGY		
The increase in electricity associated with the ~~Draft~~ 2012 AQMP control strategies is expected to be significant.	Mitigation measures E-1 through E-7 have been identified which would encourage energy efficient equipment/vehicles, encourage increasing capacity of transmission lines, development of project electricity requirements, require energy analyses in environmental documentation, and identify measures to reduce peak energy demand.	Impacts on electricity demand are expected to remain significant following mitigation.
The natural gas impacts from the implementation of the ~~Draft~~ 2012 AQMP are expected to be significant.	Mitigation measures E-8 through E-12 have been identified which would promote energy efficiency and energy conservation, increasing the capacity of natural gas lines, development of project natural gas requirements, require energy analyses in environmental documentation, and identify measures to reduce peak energy demand.	Impacts on natural gas demand are expected to remain significant following mitigation.

TABLE 1-1 (CONTINUED)

Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
ENERGY (cont.)		
Implementation of the 2012 AQMP is not expected to result in a significant increase on petroleum fuel use and impacts are less than significant.	None required since no significant impacts were identified.	Impacts on petroleum fuel use are expected to be less than significant.
Implementation of the 2012 AQMP is not expected to result in a significant increase on alternative transportation fuel use (e.g., natural gas and hydrogen) and impacts on alternative fuels are less than significant.	None required since no significant impacts were identified.	Impacts are expected to be less than significant.
HAZARDS AND HAZARDOUS MATERIALS		
The analysis indicates that the fire hazard impacts associated with reformulated coatings, solvents, adhesives, mold release and consumer products may are potentially significant.	Mitigation measures HZ-1 and HZ-2 would be implemented which would add consumer warning requirements for all flammable and extremely flammable products and require public education regarding the use of flammable materials.	Potential fire hazards are expected to be mitigated to less than significant.
The hazard impacts associated with the use of alternative fuels were determined to be less than significant for methanol, ethanol, CNG, LPG, biodiesel, hydrogen and electric/hybrids.	None required since no significant impacts were identified.	Hazard impacts for methanol, ethanol, CNG, LPG, biodiesel, hydrogen and electric/hybrids are expected to be less than significant.
The transportation hazard impacts associated with the use of LNG were determined to be significant.	Mitigation measures HZ-3 through HZ-6 would be implemented which would require the installation of secondary containment, valves that fail shut, emergency release valves, barriers to prevent physical damage to tanks, and require integrity testing to prevent failure.	Transportation hazards associated with LNG are expected to remain significant.
The use of ammonia in SCRs and SNCR would result in the increased transport of ammonia and potentially significant impacts in the event of a release.	The use of aqueous ammonia at concentrations less than 20 percent is recommended to minimize impacts.	The use of aqueous ammonia at concentrations less than 20 percent would reduce ammonia transport impacts to less than significant.

TABLE 1-1 (CONTINUED)

Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
HAZARDS AND HAZARDOUS MATERIALS (cont.)		
The use of ammonia in SCRs and SNCR is considered to be potentially significant and could create significant impacts in the event of an onsite spill.	Mitigation measures HZ-7 though HZ-10 would be implemented which require the installation of safety devices (e.g., tank monitors, lead detection systems), secondary spill containment, and modifications to loading/unloading areas to minimize spills and assure any spills remain onsite.	The use of aqueous ammonia at concentrations less than 20 percent by volume in conjunction with additional mitigation measures are expected to reduce hazard impacts to less than significant.
The hazard impacts associated with fuel additives are expected to be less than significant since the use of fuel additives would require evaluation for their potential health and environmental impacts prior to approval and use.	None required since no significant impacts were identified.	Hazard impacts associated with fuel additives are expected to be less than significant.
The hazards pertaining to safety issues associated with start-up, shutdown, and turnaround procedures or from the increased use of catalyst are less than significant.	None required since no significant impacts were identified.	Hazard impacts associated with start-up, shutdown, and turnaround procedures and associated with the use of catalysts are expected to be less than significant.
HYDROLOGY AND WATER QUALITY		
Wastewater treatment facilities are expected to have sufficient capacity to handle the estimated increase in wastewater that could be generated from reformulation of products and use of air pollution control equipment (e.g., wet ESPs and WGSs). Therefore, no significant impacts associated with wastewater treatment or water quality is expected.	None required since no significant impacts were identified.	Wastewater treatment and water quality impacts are expected to be less than significant.
The use of alternative fuels is not expected to result in greater adverse water quality impacts than the use of regular diesel fuels and is, therefore, less than significant.	None required since no significant impacts were identified.	Alternative fuel impacts on water quality are expected to be less than significant.
No significant adverse water quality impacts are expected from the increased use of EV and hybrid vehicles.	None required since no significant impacts were identified.	Water quality impacts associated with the increased use of EV/hybrids vehicles are expected to be less than significant.

TABLE 1-1 (CONTINUED)

Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
HYDROLOGY AND WATER QUALITY (cont.)		
Water demand associated with the manufacture and use of waterborne and add-on air pollution control technologies are potentially significant.	Mitigation measures HWQ-1 through HWQ-4 were imposed which include the preparation of updated Urban Water Management Plans; development of Water Supply Assessments on a project specific basis; and develop water conservation measures and encourage the use of recycled water.	Mitigation measures vary from jurisdiction to jurisdiction and water demand impacts may remain significant.
The use and application of SBS should be controlled and monitored to prevent water quality runoff and related water quality impacts. The use of SBS is expected to be less than significant.	None required since no significant impacts were identified.	Water quality impacts associated with the use of SBS are expected to be less than significant.
Potential spills associated with ammonia are expected to be contained on-site due to the requirement for secondary spill containment devices and berms. Therefore, potential ammonia spills are expected to be less than significant.	None required since no significant impacts were identified.	Water quality impacts associated with ammonia use are expected to be less than significant.
LAND USE AND PLANNING		
The ~~Draft~~2012 AQMP control measures are not expected to conflict with applicable land use plans, policies, or regulations or physically divide an established community. Therefore, no significant adverse land use impacts are expected.	None required since no significant impacts were identified.	Land use impacts are expected to be less than significant.

TABLE 1-1 (CONTINUED)

Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
NOISE		
Noise and vibration impacts will be temporary in nature and related solely to construction activities, but could be significant.	Noise and vibration mitigation measures include NO-1 through NO-9 which would require site-specific construction noise reduction programs, measures to track noise complaints, use of noise barriers and other noise attenuation measures, use of engineers to estimate noise vibration levels required to avoid building impacts, compliance with noise ordinances and regulations, and completion of noise evaluations in environmental documents.	Noise impacts may remain significant during construction activities.
No modification to existing rail or truck traffic routes/corridor is expected; therefore, noise and vibration impacts associated with operational activities are expected to be less than significant.	None required since no significant impacts were identified.	Noise impacts during project operation are expected to be less than significant.
SOLID AND HAZARDOUS WASTE		
The increased use of EVs and hybrids are not expected to result in a significant increase in the illegal disposal of batteries. NiMH and Li-ion batteries more common with EVs and hybrids have a long battery life, are valuable, and usually have a monetary incentive associated with return of the battery to the manufacturer.	None required since no significant impacts were identified.	Waste impacts associated with increased use of EV/Hybrids are expected to be less than significant.
No significant solid and hazardous waste impacts were identified due to air pollution control technologies as part of the ~~Draft~~2012 AQMP.	None required since no significant impacts were identified.	Waste impacts associated with air pollution control technologies are expected to be less than significant.

TABLE 1-1 (CONCLUDED)

Summary of Environmental Impacts, Mitigation Measures, and Residual Impacts

IMPACT	MITIGATION MEASURES	RESIDUAL IMPACT
TRANSPORTATION AND TRAFFIC		
Control measures that would require new equipment will generally require that it occur as the life of the old equipment is exhausted, be reused outside the district, or recycled. Therefore, no significant solid/hazardous waste impacts were identified due to implementation of the control measures.	None required since no significant impacts were identified.	Waste impacts associated with the retirement of old equipment are expected to be less than significant.
Construction-related traffic impacts associated with the installation of catenary overhead electrical lines and related facilities, although temporary in nature, could be significant.	Mitigation measures will need to be developed on a project-specific basis. The SCAQMD recommends that mitigation measure TT-1 be implemented for applicable projects that may impact roadways, which requires that a detailed traffic management plan should be developed for construction activities.	The mitigation measure is expected to reduce the traffic impacts during construction activities; however, construction traffic impacts are expected to remain significant
Adverse operational traffic impacts may also occur as overhead catenary electrical lines could require dedicated lanes.	Mitigation measures would need to be developed on a project-specific basis.	Operational traffic impacts are expected to remain significant.

CHAPTER 2

PROJECT DESCRIPTION

Introduction

Background

Agency Authority – 2012 AQMP

Agency Authority - CEQA

Project Location

Overall Attainment Strategy

Purpose of the 2012 AQMP

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2.1 INTRODUCTION

The SCAQMD was created by the California legislature in 1977[1] as the public agency responsible for developing and enforcing air pollution control regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin and Mojave Desert Air Basin referred to herein as the district. The Lewis Air Quality Act (now known as the Lewis-Presley Air Quality Management Act) requires the SCAQMD to prepare and adopt an Air Quality Management Plan (AQMP) consistent with federal planning requirements. In 1977, amendments to the federal Clean Air Act (CAA) included requirements for submitting State Implementation Plans (SIPs) for nonattainment areas that fail to meet all federal ambient air quality standards (CAA § 172) and similar requirements exist in state law (Health & Safety Code §40462). The federal CAA was amended in 1990 to specify attainment dates and SIP requirements for ozone, carbon monoxide (CO), nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter of less than 10 microns (PM10). In 1997, the United States Environmental Protection Agency (EPA) promulgated ambient air quality standards for a new pollutant, particulate matter with an aerodynamic diameter less than 2.5 microns (PM2.5). The California Clean Air Act (CCAA), adopted in 1988, requires the SCAQMD to endeavor to achieve and maintain state ambient air quality standards for ozone, CO, sulfur dioxide (SO2), and NO2 by the earliest practicable date (Health & Safety Code §40910). The CCAA also requires a three-year plan review if necessary, and an update to the AQMP. The EPA is required to periodically update the national ambient air quality standards. The AQMP revision currently under development is primarily triggered by an update to the PM2.5 standard, but also provides requirements to attain the (revoked) one-hour ozone standard and measures to continue making progress toward attaining the 8-hour ozone standard.

2.2 BACKGROUND

The first AQMP was prepared and approved by the SCAQMD in 1979 and has been updated and revised eight times since first adopted. The 2012 AQMP will be the tenth plan, not including certain SIPs for specific pollutants (e.g., PM10 for the Coachella Valley and lead), prepared by the SCAQMD. The following bullets summarize the main components of the past AQMP updates and revisions:

- The 1982 AQMP was revised to reflect better data and modeling tools.
- In 1987, a federal court ordered the U.S. Environmental Protection Agency (U.S. EPA) to disapprove the 1982 AQMP because it did not demonstrate attainment of all national ambient air quality standards (NAAQS) by 1987 as required by the CAA. This, in part, led to the preparation of the 1989 AQMP.
- The 1989 AQMP was adopted on March 17, 1989 and was specifically designed to attain all NAAQS. This plan called for three "tiers" of measures as needed to attain all standards and relied on significant future technology advancement to attain these standards.
- In 1991, the SCAQMD prepared and adopted the 1991 AQMP to comply with the CCAA.

[1] The Lewis-Presley Air Quality Management Act, 1976 Cal. State. ch. 324 (codified at H & S Code, Sections 40400 - 40540).

- In 1992, the 1991 AQMP was amended to add a control measure containing market incentive programs.
- In 1994, the SCAQMD prepared and adopted the 1994 AQMP to comply with the CCAA three-year update requirement and to meet the federal CAA requirement for an ozone SIP. The AQMP, as adopted in 1994, included the following:
  - All geographical areas under the jurisdiction of the SCAQMD (referred to here as the district), as opposed to just the South Coast Air Basin;
  - The basic control strategies remained the same although the three-tiered structure of control measures was replaced and measures previously referred to as Tier I, II or III were replaced with short-/intermediate-term or long-term control measures;
  - Updated and refined control measures carried over from 1991;
  - Best Available Control Measure (BACM) PM10 Plan;
  - The ozone attainment demonstration plan;
  - Amendments to the federal Reactive Organic Compound (ROC) Rate-of-Progress Plan (also referred to as the volatile organic compound (VOC) Rate-of-Progress Plan); and
  - Attainment Demonstration Plans for the federal PM10, nitrogen dioxide, and carbon monoxide air quality standards; etc.
- The 1997 AQMP was designed to comply with the three-year update requirements specified in the CCAA as well as to include an attainment demonstration for PM10 as required by the federal CAA. Relative to ozone, the 1997 AQMP contained the following changes to the control strategies compared to the 1994 AQMP:
  - Less reliance on transportation control measures (TCMs);
  - Less reliance on long-term control measures that rely on future technologies as allowed under §182 (e)(5) of the CAA; and
  - Removal of other infeasible control measures and indirect source measures.
- In 1999, the ozone plan portion of the 1997 AQMP was amended to address partial disapproval of the 1997 AQMP by the U.S. EPA and a settlement of litigation by environmental groups challenging the 1997 AQMP to provide the following:
  - Greater emission reductions in the near-term than would occur under the 1997 AQMP;
  - Early adoption of the measures that would otherwise be contained in the next three-year update of the AQMP; and
  - Additional flexibility relative to substituting new measures for infeasible measures and recognition of the relevance of cost effectiveness in determining feasibility.

- In April 2000, U.S. EPA approved the 1999 ozone SIP amendments to the 1997 plan. The 1999 Amendment in part addressed the State's requirements for a triennial plan update.
- The 2003 AQMP was approved and adopted by the SCAQMD in August 2003. The 2003 AQMP was never fully approved by the U.S. EPA as part of the SIP. The 2003 AQMP addressed the following control strategies:
    - Attaining the federal PM10 ambient air quality standard for the South Coast Air Basin and Coachella Valley - these portions were approved by the U.S. EPA; in both areas, the ozone attainment demonstration was disapproved after the California Air Resources Board (CARB) withdrew its measures;
    - Attaining the federal one-hour ozone standard;
    - 1997/1999 control measures not yet implemented;
    - Revisions to the Post-1996 VOC Rate-of-Progress Plan and SIP for CO;
    - Initial analysis of emission reductions necessary to attain the PM2.5 and eight-hour ozone standards; etc.; and
    - The 2003 AQMP was partially approved and partially disapproved by EPA.
- The SCAQMD Governing Board approved the 2007 AQMP on June 1, 2007. On September 27, 2007, CARB adopted the State Strategy for the 2007 State Implementation Plan and the 2007 South Coast Air Quality Management Plan as part of the (SIP). The 2007 SIP was then forwarded to U.S. EPA for approval. The following summarize the major components of the 2007 AQMP:
    - The most current air quality setting (e.g., 2005 data);
    - Updated emission inventories using 2002 as the base year, which also incorporate measures adopted since adopting the 2003 AQMP;
    - Updated emission inventories of stationary and mobile on-road and off-road sources;
    - 2003 AQMP control measures not yet implemented (eight of the control measures originally contained in the 2003 AQMP were updated or revised for inclusion into the Draft 2007 AQMP);
    - 24 new measures were incorporated into the 2007 AQMP based on replacing the SCAQMD's long-term control measures from the 2003 AQMP with more defined or new control measures and control measure adoption and implementation schedules;
    - CARB's recommended 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;
    - SCAG's regional transportation strategy and control measures; and
    - Analysis of emission reductions necessary and attainment demonstrations to achieve the federal eight-hour ozone and PM2.5 air quality standards.

On November 22, 2010, U.S. EPA issued a notice of proposed partial approval and partial disapproval of the 2007 South Coast SIP for the 1997 Fine Particulate Matter Standards and the corresponding 2007 State Strategy. Specifically, U.S. EPA proposed approving the SIP's inventory and regional modeling analyses, but it also proposed disapproving the attainment demonstration because it relied too extensively on commitments to emission reductions in lieu of fully adopted, submitted, and SIP-approved rules. The notice also cited deficiencies in the SIP's contingency measures.

- In response to U.S. EPA's proposed partial disapproval of the 2007 SIP, on March 4, 2011, the SCAQMD Governing Board approved Revisions to the 2007 PM2.5 and Ozone State Implementation Plan for South Coast Air Basin and Coachella Valley. The revisions to the 2007 PM2.5 and Ozone SIP consist of the following:
  - Updated implementation status of SCAQMD control measures necessary to meet the 2015 PM2.5 attainment date;
  - Revisions to the control measure adoption schedule;
  - Changes made to the emission inventory resulting from ~~California Air Resources Board's (~~CARB's~~)~~ December 2010 revisions to the on-road truck and off-road equipment rules; and
  - An SCAQMD commitment to its "fair share" of additional NOx emission reductions, if needed, in the event U.S. EPA does not voluntarily accept the "federal assignment."
- In response to the July 14, 2011 U.S. EPA notice of proposed partial approval and partial disapproval of the 2007 South Coast SIP for the 1997 Fine Particulate Matter Standards, at the October 7, 2011 public hearing, the SCAQMD Governing Board approved Further Revisions to PM2.5 and Ozone State Implementation Plan for South Coast Air Basin and Coachella Valley. Revisions to the PM2.5 SIP included a three-prong approach for identifying contingency measures needed to address U.S. EPA's partial disapproval:
  - Equivalent emissions reductions achieved through improvements in air quality;
  - Relying on committed emissions reductions for the 2007 ozone plan;
  - Quantifying excess emissions reductions achieved by existing rules and programs that were not originally included in the 2007 PM2.5 SIP;
  - U.S. EPA approved the PM2.5 SIP except for contingency measures on November 9, 2011. Action is pending on the contingency measures; and
  - U.S. EPA fully approved the 2007 SIP for the 8-hour ozone standard on March 1, 2012.

2.2.1 Progress Implementing the 2007 AQMP

The SCAQMD has fulfilled the majority of its emissions reductions commitments specified in the 2007 SIP. Table 2-1 summarizes the progress achieved toward fulfilling SCAQMD's emissions reductions commitments to attain the 1997 PM2.5 annual and federal 8-hour ozone standards by the required dates. Through January 31, 2011, the SCAQMD Governing Board has amended and adopted 12 rules. The majority of these rules have been submitted to U.S. EPA and approved as part of the SIP. Several recently adopted SCAQMD rules have been submitted to CARB and have been or are expected to be submitted to and subsequently evaluated by U.S. EPA. As shown in Table 2-1, for the control measures adopted by the SCAQMD ~~District~~ over this period, 22.5 tons per day of VOC reductions, 7.6 tons per day of NOx reductions, 4.0 tons per day of SOx reductions, and 1.0 tons per day of PM2.5 reductions will be achieved by 2014. Additional reductions from these adopted rules will be achieved by 2023.

TABLE 2-1

Total 2007 AQMP Emission Reductions
from SCAQMD Control Measures (tons per day)

	COMMITMENT [a]		**ACHIEVED** [a]	
Pollutant	**2014**	**2023**	**2014**	**2023**
VOC	10.4	19.2	22.5	26.4
NOx	10.8	9.2	7.6	10.3
PM2.5	2.9	5.4	1.0	1.6
SOx	2.9	2.9	4.0	5.7

Source: 2012 AQMP, Chapter 1, Table 1-2
[a] 2014 reductions estimated in average annual day, 2023 in planning inventory.

Table 2-2 lists the 2007 AQMP's control measure commitments that have been adopted (either entirely or partially) by CARB since the 2007 AQMP was adopted. The emissions are presented in terms of remaining emissions, rather than reductions, due to some significant changes to the inventory that preclude a direct comparison of committed emissions to those achieved. The table is based on SIP revisions submitted to U.S. EPA in 2011, and thus reflect adopted measures through specific dates in 2011 as described in the footnotes. In combination with the regulatory activity and revised inventory forecast, CARB has achieved the emission targets for both 2014 and 2023.

TABLE 2-2

South Coast Air Basin Remaining Emissions Due to CARB Actions

CARB REGULATIONS	COMMITMENT		ACHIEVED	
	2014[a]	2023[b]	2014[a]	2023[b]
NOx EMISSIONS (TPD)[c]				
Smog Check Improvements (BAR)	134.2	74.3	131.6	73.1
Cleaner In-Use Heavy-Duty Trucks & Buses	151.2	76.8	132.6	49.4
Cleaner In-Use Off-Road Equipment (over 25 hp)	28.0	18.9	27.5	15.8
Ship Auxiliary Engine Cold Ironing & Clean Tech.	23.7	40.3	15.6	12.0
Cleaner Main Ship Engines and Fuel - Main Engines	38.5	65.8	20.9	21.3
Accelerated Intro. of Cleaner Line-Haul Locomotives	18.3	21.0	18.3	21.0
Clean Up Existing Harbor Craft	15.2	18.4	11.1	8.4
Cargo Handling Equipment	3.2	1.8	3.2	1.8
New Emission Standards for Recreational Boats	11.0	18.3	11.0	18.3
Co-Benefits from Greenhouse Gas Reduction Measures[d]	--	--	--	--
All other local, state, and federal emissions	166	157	159	147[e]
TOTAL NOx REMAINING EMISSIONS WITH RULES ADOPTED TO DATE	**589**	**493**	**530**	**368**
VOC EMISSIONS (TPD)[c]				
Smog Check Improvements (BAR)	132.1	97.4	123.5	92.1
Cleaner In-Use Heavy-Duty Trucks & Buses	8.7	6.6	5.4	5.3
Cleaner In-Use Off-Road Equipment (over 25 hp)	2.6	2.0	2.5	1.7
Ship Auxiliary Engine Cold Ironing & Clean Tech.	0.9	1.5	0.7	0.9
Cleaner Main Ship Engines and Fuel - Main Engines	1.9	3.2	1.4	2.5
Accelerated Intro. of Cleaner Line-Haul Locomotives	2.3	2.4	2.3	2.4
Clean Up Existing Harbor Craft	1.2	1.0	1.1	0.5
Cargo Handling Equipment	0.3	0.6	0.3	0.6

TABLE 2-2 (Continued)

South Coast Air Basin Remaining Emissions Due to CARB Actions

CARB REGULATIONS	COMMITMENT		ACHIEVED	
	2014[a]	2023[b]	2014[a]	2023[b]
VOC EMISSIONS (TPD)[c]				
New Emission Standards for Recreational Boats	37.9	50.8	37.9	50.8
Expanded Off-Road Rec. Vehicle Emission Standards	6.7	13.4	6.7	13.4
Consumer Products Program	102.6	109.5	96.7	102.4
All other local, state, and federal emissions	221	241	206	226[e]
TOTAL VOC REMAINING EMISSIONS WITH RULES ADOPTED TO DATE	**518**	**529**	**485**	**498**
PM2.5 EMISSIONS (TPD)[c]				
Smog Check Improvements (BAR)	7.8	--	7.5	--
Cleaner In-Use Heavy-Duty Trucks & Buses	6.0	--	3.4	--
Cleaner In-Use Off-Road Equipment (over 25 hp)	1.3	--	1.3	--
Ship Auxiliary Engine Cold Ironing & Clean Tech.	0.5	--	0.4	--
Cleaner Main Ship Engines and Fuel - Main Engines	3.9	--	0.4	--
Accelerated Intro. of Cleaner Line-Haul Locomotives	0.7	--	0.7	--
Clean Up Existing Harbor Craft	0.6	--	0.4	--
Cargo Handling Equipment	0.1	--	0.1	--
All other local, state, and federal emissions	74	--	73	--
TOTAL PM2.5 REMAINING EMISSIONS WITH RULES ADOPTED TO DATE	**95**	**--**	**87**	**--**

TABLE 2-2 (Concluded)
South Coast Air Basin Remaining Emissions Due to CARB Actions

CARB REGULATIONS	COMMITMENT		ACHIEVED	
SOx EMISSIONS (TPD)[c]				
Cleaner In-Use Heavy-Duty Trucks & Buses	0.3	--	0.3	--
Ship Auxiliary Engine Cold Ironing & Clean Tech.	1.1	--	0.8	--
Cleaner Main Ship Engines and Fuel - Main Engines	38.7	--	1.7	--
All other local, state, and federal emissions	21	--	17	--
TOTAL SOX REMAINING EMISSIONS WITH RULES ADOPTED TO DATE	**61**	--	**20**	--

a. The 2014 emissions data reflect the 2014 Emissions Inventory that was included in the March 2011 *Progress Report on Implementation of PM2.5 State Implementation Plans*. The inventory is in the process of being updated, and may change slightly in the final 2012 AQMP ~~draft~~.
b. The 2023 emissions data tables reflect the 2023 Emissions Inventory that was current as of August 2011. The inventory is in the process of being updated, and may change slightly in the final 2012 AQMP ~~draft~~.
c. These are remaining emissions. If achieved emissions are lower than the committed emissions, it means the SIP targets are met.
d. Remaining emissions are included in "other local, state, and federal emissions"
e. Includes benefits of local emission reductions that were not reflected in the revised RFP estimates.

2.3 AGENCY AUTHORITY – 2012 AQMP

The 2012 AQMP sets forth emission reduction programs which require the cooperation of all levels of government: local, regional, state, and federal, as well as public engagement. Each level is represented in the AQMP by the appropriate agency or jurisdiction that has the authority over specific emissions sources. Accordingly, each agency or jurisdiction commits to specific planning and implementation responsibilities.

At the federal level, the U.S. EPA is charged with establishing emission standards including motor vehicle standards; train, airplane, and ship pollutant exhaust and fuel standards; and regulation of non-road engines less than 175 horsepower. CARB, representing the state level, also oversees development of 2012 AQMP control measures for on-road vehicle emission standards in California; motor vehicle fuel specifications; some off-road source emission standards and fuel standards, including marine vessels; and consumer product standards. At the regional level, the SCAQMD is responsible primarily for non-vehicular sources and has limited authority over mobile sources (e.g., in-use fleet regulations, incentives for accelerated vehicle turnover, reduction in average vehicle ridership, etc.). In addition, the SCAQMD has lead responsibility for developing stationary, some area, and indirect source control measures and coordinating the development and adoption of the 2012 AQMP. Lastly, at the local level, the cities and counties and their various departments (e.g., harbors and airports) have a dual role related to transportation and land use. Their efforts are coordinated through the regional metropolitan planning organization for the South Coast Air Basin, the Southern California Association of Governments (SCAG), which is responsible for preparing the transportation control measure component of the 2012 AQMP. Interagency commitment and cooperation are the keys to success of the 2012 AQMP.

2.4 AGENCY AUTHORITY – CEQA

CEQA, Public Resources Code §21000 et seq., requires that the environmental impacts of proposed projects implemented or approved by governmental agencies be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. The lead agency is the "public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect upon the environment" (Public Resources Code Section 21067). Since the SCAQMD has the primary responsibility for supervising or approving the entire project as a whole, it is the most appropriate public agency to act as lead agency (CEQA Guidelines Section 15051 (b)).

A Program Environmental Impact Report (Program EIR) for the 2012 AQMP is considered to be the appropriate document pursuant to CEQA Guidelines Section 15168 (a)(3), because the 2012 AQMP constitutes a series of actions that can be characterized as one large project and are related in the connection with the issuance or rules, regulations, plans, or other criteria to govern the conduct of a continuing program.

As the lead agency for the ~~proposed~~ 2012 AQMP, SCAQMD staff prepared a Notice of Preparation/Initial Study (NOP/IS) for the ~~proposed~~ 2012 AQMP Program EIR on June 28, 2012. Due to changes in the project description during circulation of the original 6/28/12 NOP/IS circulation, the NOP/IS was revised and recirculated for a 30-day public review and comment period. The NOP/IS was recirculated for a 30-day public review and comment period from August 2, 2012 through August 31, 2012. Seven scoping meetings were held on July 10, 2012 (two meetings), July 11, 2012, July 12, 2012, July 24, 2012, August 9, 2012 and August 23, 2012. Eleven comment letters were submitted to staff in response to the NOP/IS that was circulated on June 28, 2012. No comments were received in response to the NOP/IS that was circulated on August 2, 2012. A copy of the recirculated 8/2/12 ~~6/28/12~~ NOP/IS can be found in Appendix A. Comments and responses to comments received on the 6/28/12 NOP/IS can be found in Appendix B. As indicated in Appendix C, no comment letters were received on the 8/2/12 NOP/IS. ~~A copy of the recirculated NOP/IS can be found in Appendix C.~~ Comments received at the scoping meetings and the responses to these comments ~~received on the recirculated NOP/IS~~ can be found in Appendix D.

2.5 PROJECT LOCATION

The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, consisting of the four-county South Coast Air Basin (Basin) (all of Orange County and the non-desert portions of Los Angeles, Riverside and San Bernardino counties), and the Riverside County portions of the Salton Sea Air Basin (SSAB) and Mojave Desert Air Basin (MDAB), referred to hereafter as the district. The Basin, which is a subregion of the SCAQMD's jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. It includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of the Riverside County and the SSAB that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 2-1).

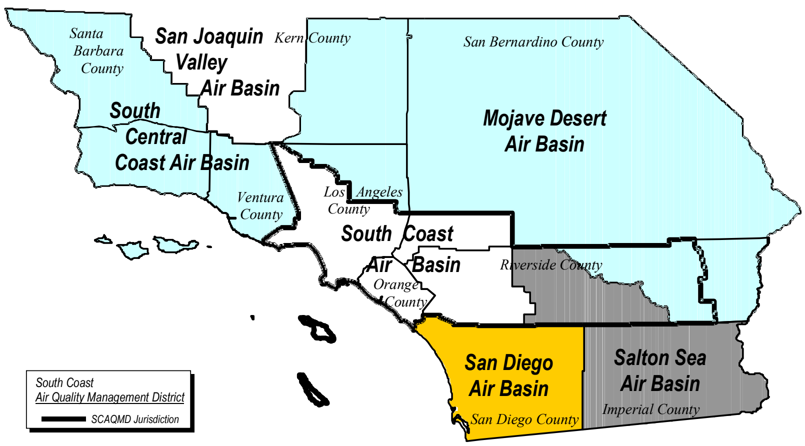

FIGURE 2-1

Southern California Air Basins

2.6 OVERALL ATTAINMENT STRATEGY

The overall control strategy for the ~~Draft~~ 2012 AQMP is designed to meet applicable federal and state requirements. The focus of the AQMP is to demonstrate attainment of the federal 24-hour PM2.5 ambient air quality standard by 2014, while making expeditious progress toward attainment of state PM standards. In addition, to further implement the existing 8-hour ozone plan, the 2012 AQMP includes section 182 (e)(5) implementation measures designed to assist in future attainment of the 8-hour ozone standard (refer to subsection 1.6.1). The proposed control measures in the ~~Draft~~ 2012 AQMP are based on implementing all feasible control measures through the application of available technologies and management practices as well as development and deployment of advanced technologies and control methods. In addition, SCAQMD retains certain obligations relative to the (revoked) one-hour ozone standard. For purposes of the environmental analysis, it is expected that full implementation of the attainment strategy for the one-hour ozone standard would have the same environmental effects as implementing all the measures in the ~~Draft~~ 2012 AQMP and the section 182 (e)(5) measures for the eight-hour standard that were already analyzed in the EIR for the 2007 AQMP. 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 approaches taken in previous AQMPs, the SIP commitment includes an adoption and implementation schedule for each control measure. Each agency is also committed to achieving a total emission reduction target with the ability to substitute specified control measures for control measures deemed infeasible, as 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 [§172 (c)], and the California requirement of Best Available Retrofit Control Technologies (BARCT) [Health and Safety Code §40440 (b)(1)].

To ultimately achieve the ozone ambient air quality standards and demonstrate attainment, significant NOx emissions reductions will be necessary, not only from non-vehicular sources under the jurisdiction of the SCAQMD, but substantial reductions will be necessary from sources 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 stationary sources that are already stringently regulated. The SCAQMD will continue to work closely with CARB to further control mobile source emissions where federal or State actions do not meet regional needs.

2.6.1 One-hour Ozone Standard Attainment Strategy

The federal one-hour ozone standard was revoked, effective one year after the eight-hour standard designations were effective (e.g., 2005). U.S. EPA guidance indicated that while certain planning requirements remained in effect, a new SIP would not be required if an area failed to attain the standard by the attainment date. However, recent litigation and court decisions have suggested that there likely will be a need for the SCAQMD to prepare a new one-hour ozone SIP in the near future. If a one-hour ozone SIP is requested by U.S. EPA, the SIP would likely be due within 12 months of such a SIP call. The attainment demonstration in the SIP would have to show attainment within five years with a potential five-year extension, which would be a similar timeframe (2022) as is required for the 1997 eight-hour ozone standard (deadline of 2023). However, many new technical issues such as modeling for the attainment demonstration and other CAA requirements would require U.S. EPA's guidance, since the previous preambles/guidelines are no longer directly applicable. Based on previous modeling estimates, the types of control strategies and the amount of reductions that are needed to attain the eight-hour ozone standard are nearly identical to those that would be needed to attain the one-hour ozone standard.

Although the primary purpose of the 2012 AQMP Basin is to set forth a comprehensive and integrated program that will lead the Basin into compliance with the federal 24-hour PM2.5 air quality standard, it will also provide an update of certain elements for the 2007 eight-hour ozone plan. The AQMP will update specific elements of the previously approved eight-hour ozone SIP: 1) an updated emissions inventory, and 2) new control measures and commitments for emissions reductions to help fulfill the §182 (e)(5) portion of the eight-hour ozone SIP and one-hour ozone SIP.

In anticipation that U.S. EPA would likely request that the SCAQMD prepare a one-hour ozone SIP, the Final Program EIR for the 2012 AQMP includes 11 project objectives[2] (see Section 2.9), including the following:

1. Continue making expeditious progress towards attaining the federal eight-hour ozone standard and demonstrate attainment of the federal one-hour ozone standard (revoked) by 2022 – 2023;

2. Reduce population exposure to ozone through continued progress towards attaining the federal one-hour (revoked) and eight-hour ozone standards by 2022 – 2023;

~~Regardless of whether or not U.S. EPA requests that the SCAQMD prepare a one-hour ozone SIP, t~~The 2012 AQMP ~~reflects a multi-agency effort to identify 2012 AQMP~~ includes control measures that specifically address the SCAQMD's efforts to continue making progress towards attaining all state and national ambient air quality standards for ozone. For example, there are four coatings and solvent control measures (CTS 01, CTS02, CTS-03, and CTS-04; Table 2-3); two combustion control measures (CMB-01, RECLAIM phase 2, and CMB-02; Table 2-3); and five §182 (e)(5) implementation measures for on-road mobile sources, five off-road mobile source control measures, and seven advanced control measures (Table 2-4) that all primarily address attaining the ozone standards.

The 2012 AQMP reflects a multi-agency effort ~~to identify 2012 AQMP control measures~~ that specifically addresses the SCAQMD's efforts to attain the federal 24-hour PM2.5 standard and the federal one-hour (revoked) and eight-hour ozone standards by 2022 – 2023, respectively. Consistent with CEQA requirements to analyze the whole of the actions from a project, the Final Program EIR prepared for the 2012 AQMP includes an environmental analysis of all PM2.5 control measures, as well as, all of the ozone-related control measures in the 2012 AQMP.

On September 19, 2012, the U.S. EPA published in the Federal Register a proposed "SIP call" which, if finalized, would require the SCAQMD to prepare a demonstration of attainment of the one-hour ozone standard, with attainment required by ten years from the date the SIP call is finalized. The same day, the U.S. EPA published in the Federal Register a proposal to withdraw its approval of, and then to disapprove, the transportation control measure (TCM) demonstrations, also referred to as VMT emissions offset demonstrations, in the 2003 one-hour ozone plan and the 2007 eight-hour ozone plan. As explained by the U.S. EPA, both of these actions were taken in response to a decision of the Ninth Circuit Court of Appeals in Association of Irritated Residents v. EPA, January 27, 2012.

In response to the U.S. EPA's "SIP call" and in anticipation that it will be finalized, SCAQMD staff has prepared this *One-hour Ozone Attainment Demonstration*, which demonstrates attainment of the federal one-hour (revoked) ozone standard by the year 2022. The federal one-hour ozone attainment demonstration in this document contains all of the

[2] CEQA Guidelines §15124 (b).

same ozone control measures that are included in the 2012 AQMP, as well as, the seven remaining mobile source control measures from the 2007 AQMP.

~~No other control measures to attain the ozone standards were identified during the multi-agency effort to identify 2012 AQMP control measures.~~

Similarly, in connection with the proposed disapproval of the TCM demonstrations for the South Coast Air Basin, the U.S. EPA prepared a guidance document[3] for Severe and Extreme ozone nonattainment areas on how to address Clean Air Act (CAA) §182 (d)(1)(A) (VMT emissions offset demonstrations). SCAQMD staff conducted a VMT emissions offset analysis pursuant to U.S. EPA guidance and concluded that actual emissions with controls and VMT growth were substantially less than emissions assuming no new measures and no VMT growth ("ceiling"). Based on this conclusion, no new TCMs are required for the one-hour ozone SIP. SCAQMD staff has prepared the *VMT Offset Requirement Demonstration* (2012 AQMP Appendix VIII) to provide the results of the VMT emissions offset analysis to the public.

With regard to the seven mobile source control measures from the 2007 AQMP, potential environmental impacts from these control measures along with all other 2007 ozone and PM2.5 control measures were evaluated in the Final Program EIR for the 2007 AQMP (SCH #2006111064), certified by the SCAQMD Governing Board on June 1, 2007. These remaining measures would be implemented even without the 2012 AQMP. For this reason, the seven mobile source control measures, as well as four other remaining control measures from the 2007 AQMP, were also evaluated as Alternative 1, the No Project Alternative, in the 2012 AQMP Program EIR, which concluded that implementation of the remaining 2007 AQMP control measures would not generate any significant adverse environmental impacts. An acknowledgment of existing 2007 AQMP control measures in this *One-hour Ozone Attainment Demonstration* does not require additional environmental review where no changes are being proposed to the 2007 measures.

~~As a result~~ Based on the above information, the 2012 AQMP can rely on the same ~~no additional~~ control measures and TCMs to address progress in attaining the federal one-hour (revoked) and eight-hour ozone standards by 2022 – 2023.~~would likely be identified.~~ This means that ~~a~~ the ~~o~~*One-hour* ~~o~~*Ozone* ~~SIP~~ *Attainment Demonstration* (Appendix VII) ~~would~~ includes all of the same ozone-related control measures as the 2012 AQMP. Further, the timing or implementation dates of any of the control measures would not be changed to meet the one-hour standard compared to timing and implementation dates in the 2012 AQMP. ~~Further~~Therefore, by analyzing the 2012 AQMP ozone-related control measures in this Final Program EIR, this Final Program EIR would also serve as the CEQA document for the *One-hour Ozone Attainment Demonstration* (2012 AQMP Appendix VII) and the *VMT Offset Requirement Demonstration* (2012 AQMP Appendix VIII).~~a one-hour ozone SIP.~~ Finally, potential impacts from the seven remaining mobile source ozone control measures from the 2007 AQMP have been disclosed to the public in the 2007 AQMP and as part of the

[3] U.S. EPA. Office of Transportation and Air Quality. 2012. *Implementing Clean Air Act Section 182 (d)(1)(A): Transportation Control Measures and Transportation Control Strategies to Offset Growth in Emissions Due to Growth in Vehicle Miles Travelled.* EPA-420-B-12-053. August. http://www.epa.gov/otaq/stateresources/policy/general/420b12053.pdf.

alternatives analysis in the Final Program EIR for the 2012 AQMP. Since no changes are being proposed to those existing measures, no additional environmental analysis of the 2007 AQMP control measures is required.

2.7 PURPOSE OF THE 2012 AQMP

The 2012 AQMP will provide an updated air pollution control strategy to attain the 24-hour PM2.5 federal ambient air quality standard and to partially fulfill the 2007 AQMP §182 (e)(5) reduction commitment. It has been developed as an integrated Plan taking into consideration: air quality, climate change, transportation, and energy needs. The 2012 AQMP focuses on PM reductions to attain the federal 24-hour PM2.5 standard by 2014. The 2012 AQMP also includes ozone reduction strategies to make expeditious progress in attaining the state one-hour and eight-hour ozone standards and the federal eight-hour ozone standards (80 parts per billion (ppb) by 2023 and 75 ppb by 2032). The 2012 AQMP also provides for meeting requirements applicable under the (revoked) one-hour federal ozone standard. In particular the ozone strategy approach relies heavily on NOx emission reductions, primarily from mobile sources, and identifies actions that can be taken in the next two to three years. The 2012 AQMP relies upon the most recent planning assumptions and the best available information such as CARB's latest EMFAC2011 for the on-road mobile source emissions inventory, CARB's OFF-ROAD 2011 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 recent 2012 Regional Transportation Plan. The 2012 AQMP includes the current and future air quality in the Coachella Valley. The 2012 AQMP also includes a discussion of ultra-fine particles, near roadway exposure and energy.

It is expected that implementing the 2012 AQMP control measures will provide benefits of improved air quality. From a public health standpoint, air pollution has been linked to long-term health problems affecting the lungs, heart, blood, brain and immune and nervous systems. Therefore, improving air quality is expected to result in improvements to public health. Additional benefits include improved visibility, reduced destruction of materials and buildings, reduced damage to agricultural crops and habitat for wildlife and, more efficient land use patterns and transportation systems. The 2012 AQMP control measures have the potential to reduce reliance on traditional petroleum fuels, thus, providing reductions in greenhouse gas emissions. The following sections summarize the overall components of the 2012 AQMP and the specific control measures that comprise the 2012 AQMP.

2.8 PROJECT DESCRIPTION

The ~~Draft~~ 2012 AQMP control measures consist of three components: 1) the SCAQMD's Stationary and Mobile Source Control Measures; 2) suggested State Mobile Source Control Measures; and 3) Regional Transportation Strategy and Control Measures provided by SCAG. These measures rely on not only the traditional command-and-control approach, but also public incentive programs, as well as advanced technologies expected to be developed and deployed in the next several years. A summary of these measures is provided in the following subsections. The following bullet points summarize the major components of the 2012 AQMP:

- The most current air quality setting (e.g., 2008 data);
- Updated emission inventories using 2008 as the base year, which also incorporate measures adopted since adopting the 2007 SIP;
- Consider the 2007 AQMP control measures not yet adopted (through January 31, 2011, the SCAQMD Governing Board has amended and adopted 13 rules achieving approximately 96 percent of the SCAQMD's SIP commitment for both PM2.5 and ozone as outlined in the 2007 AQMP);
- New measures are to be incorporated into the ~~Draft~~ 2012 AQMP;
- SCAG's 2012 regional transportation strategy and control measures;
- Analysis of emission reductions necessary to achieve the federal 24-hour PM2.5 air quality standards, and (revoked) one-hour ozone standard;
- Overview of state and federal planning requirements;
- Implementation schedule for adoption of the proposed control measures;
- Latest information on near-roadway emissions of combustion-related pollutants with particular focus on ultrafine particulates formation, transport, exposure, and health effects and potential control strategies, although there are no ambient air quality standards specifically for ultrafine particulates; and
- Energy Policy Update including: energy consumption, costs, associated emissions for base year 2008 and the future AQMP years, and associated energy impacts and GHG emissions inventory in the Basin.

2.8.1 Stationary Source Control Measures

The stationary source control measures included in the ~~Draft~~ 2012 AQMP would further reduce emissions from both point sources (permitted facilities) and area sources (generally small and non-permitted). The proposed control strategies for stationary sources under the SCAQMD's jurisdiction include implementing the remaining revised and partially implemented measures from the 2007 AQMP and new measures that are deemed feasible, which will provide additional emission reduction opportunities. In addition to PM reduction control measures, the 2012 AQMP also identifies control measures to be implemented by the SCAQMD and CARB to partially fulfill the §182 (e)(5) commitment in attaining ambient air quality standards for ozone. These control measures include short-term and Clean Air Act §182 (e)(5) implementation measures, and would regulate both stationary and mobile sources.

The basic principles followed in developing the SCAQMD's stationary source control measures included: 1) identify PM2.5, ammonia and NOx reduction opportunities and maximize reductions by the earliest possible and feasible attainment year; and, 2) initiate programs or rulemaking activities for further VOC and NOx control strategies to maximize ozone reductions by the year 2022-2023 timeframe. Therefore, the proposed control strategy for stationary sources under the SCAQMD's jurisdiction includes some revised and partially implemented measures from the 2007 AQMP and new measures that are deemed feasible to provide additional control opportunities. In addition, to foster further technology advancement, advanced clean technologies measures are also included to achieve additional reductions from sources based on implementation and accelerated penetration of advanced technologies. For each control measure, the SCAQMD will seek to achieve the maximum reduction potential that is technically feasible and cost-effective. The control measures to be implemented by the SCAQMD are listed in Table 2-3 summarized in the paragraphs following Table 2-3.

TABLE 2-3

Stationary Source Control Measures Categorized by Source Type

NUMBER	TITLE	CM TYPE	ADOPTION	IMPLEMENTATION PERIOD	REDUCTION (TPD)
PM SOURCES					
BCM-01 (*formerly MCS-04B*)	Further Reductions from Residential Wood Burning Devices [PM2.5]	Short-term 24-hr PM2.5	2013	2013-2014	7.1 [a]
BCM-02 *(new)*	Further Reductions from Open Burning [PM2.5]	Short-term 24-hr PM2.5	2013	2013-2014	4.6 [b]
BCM-03 *(formerly BCM-01 & BCM-05 in the 2007 AQMP)*	Emission Reductions from Under-Fired Charbroilers [PM2.5]	Short-term 24-hr PM2.5	Phase I – 2013 (*Tech Assessment*) Phase II - TBD	TBD	1.0 [c]
BCM-04 *(formerly MCS-04B)*	Further Ammonia Reductions from Livestock Waste [NH3]	Short-term 24-hr PM2.5	Phase I – 2013-2014 (*Tech Assessment*) Phase II - TBD	TBD	TBD [d]
COMBUSTION SOURCES					
CMB-01[i]	Further NOx Reductions from RECLAIM [NOx] – *Phase I*	Short-term 24-hr PM2.5	2013	2014	2-3
CMB-01[j]	Further NOx Reductions from RECLAIM [NOx] – *Phase II*	Section 182 (e)(5) implementation	2015	2020	1-2
CMB-02	NOx Reductions from Biogas Flares [NOx]	Section 182 (e)(5) implementation	2015	Beginning 2017	Pending[e]
CMB-03	Reductions from Commercial Space Heating [NOx]	Section 182 (e)(5) implementation	Phase I – 2014 (*Tech Assessment*) Phase II - 2016	Beginning 2018	0.18 by 2023 0.6 (total)

TABLE 2-3 (Continued)

Stationary Source Control Measures Categorized by Source Type

NUMBER	TITLE	CM TYPE	ADOPTION	IMPLEMENTATION PERIOD	REDUCTION (TPD)
COATINGS AND SOLVENTS					
CTS-01	Further VOC Reductions from Architectural Coatings (R1113) [VOC]	Section 182 (e)(5) implementation	2015 - 2016	2018 - 2020	2-4
CTS-02	Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants [VOC]	Section 182 (e)(5) implementation	2013 - 2016	2015 - 2018	1-2
CTS-03	Further VOC Reductions from Mold Release Products [VOC]	Section 182 (e)(5) implementation	2014	2016	0.8 – 2
CTS-04	Further VOC Reductions from Consumer Products [VOC]	Section 182 (e)(5) implementation	2013 - 2015	2018	N/A[f]
PETROLEUM OPERATIONS AND FUGITIVE VOC					
FUG-01	~~Further~~ VOC Reductions from Vacuum Trucks [VOC]	Section 182 (e)(5) implementation	2014	2016	1[g]
FUG-02	Emission Reduction from LPG Transfer and Dispensing [VOC] – *Phase II*	Section 182 (e)(5) implementation	2015	2017	1-2
FUG-03	Further ~~VOC~~ Reductions from Fugitive VOC Emissions [VOC]	Section 182 (e)(5) implementation	2015 -2016	2017-2018	1-2
MULTIPLE COMPONENT SOURCES					
MCS-01	Application of All Feasible Measures Assessment [All Pollutants]	Short-term 24-hr PM2.5 and section 182 (e)(5) implementation	Ongoing	Ongoing	TBD [d]
MCS-02	Further Emission Reductions from Green Waste Processing (Chipping and Grinding Operations Not Associated with Composting) [VOC]	Section 182 (e)(5) implementation	2015	2016	1 [g]
MCS-03 (*formerly MCS-06 in the 2007 AQMP*)	Improved Start-up, Shutdown and Turnaround Procedures [All Pollutants]	Section 182 (e)(5) implementation	Phase I – 2012 (*Tech Assessment*) Phase II - TBD	Phase I – 2013 (*Tech Assessment*) Phase II - TBD	TBD [d]

TABLE 2-3 (Concluded)

Stationary Source Control Measures Categorized by Source Type

NUMBER	TITLE	CM TYPE	ADOPTION	IMPLEMENTATION PERIOD	REDUCTION (TPD)
INDIRECT SOURCES					
IND -01 (*formerly MOB-03*)	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Sources [NOx, SOx, PM2.5]	Short-term 24-hr PM2.5	2013	12 months after trigger	N/A[f]
INCENTIVE PROGRAMS					
INC-01	Economic Incentive Programs to Adopt Zero and Near-Zero Technologies [NOx]	Section 182 (e)(5) implementation	2014	Within 12 months after funding availability	TBD [h]
INC-02	Expedited Permitting and CEQA Preparation Facilitating the Manufacturing of Zero and Near-Zero Technologies [All Pollutants]	Section 182 (e)(5) implementation	2014-2015	Beginning 2015	N/A[f]
EDUCATIONAL PROGRAMS					
EDU-01 (*formerly MCS-02, MCS-03*)	Further Criteria Pollutant Reductions from Education, Outreach and Incentives [All Pollutants]	Short-term 24-hr PM2.5 and Section 182 (e)(5) implementation	Ongoing	Ongoing	N/A[f]

a. Winter average day reductions based on episodic conditions and 75 percent compliance rate.
b. Reduction based on episodic day conditions.
c. Will submit into SIP once technically feasible and cost effective options are confirmed.
d. TBD are reductions to be determined once the technical assessment is complete, and inventory and control approach are identified.
e. Pending because emission reductions will be provided prior to the Final Draft.
f. N/A are reductions that cannot be quantified due to the nature of the measure (e.g., outreach, incentive programs) or if the measure is designed to ensure reductions that have been assumed to occur will, in fact, occur.
g. Reductions submitted in SIP once emission inventories are included in the SIP.
h. TBD are reductions to be determined once the inventory and control approach are identified.
i. Emission reductions are included in the SIP as a contingency measure.
j. If Control Measure CMB-01, RECLAIM Phase I, contingency measure emission reductions are not triggered and implemented, Phase II will target a cumulative 3-5 TPD of NOx emission reductions.

2.8.1.1 Summaries of the Stationary Source Control Measures

BCM-01 – Further Reductions from Residential Wood Burning Devices [PM2.5] (*formerly BCM-05 in the 2007 AQMP*) (*formerly* control measure MCS-04B): The purpose of this measure would be to seek further PM2.5 emissions reductions from residential wood burning fireplaces and wood stoves whenever key areas in the South Coast Air Basin are forecast to approach the federal 24-hour PM2.5 standard. A review of other California air district regulations has indicated that the most appropriate amendment to the existing

SCAQMD wood smoke control program would be to decrease the mandatory wood burning curtailment forecast threshold from 35 μg/m^3 to a more conservative 30 μg/m^3. In addition to the existing sub-regional curtailment program of Rule 445 (based on areas forecast to exceed the existing PM2.5 standard), this measure would implement a curtailment that would apply Basin-wide whenever a PM2.5 level of greater than 30 μg/m^3 is forecast at any monitoring station at which the design value has exceeded the current PM2.5 24-hour standard of 35 μg/m^3 for either of the two previous periods. Lowering the wood burning curtailment forecast threshold and applying the curtailment to the entire Basin when triggered could potentially reduce Basin-wide ambient PM2.5 concentrations on these episodic no-burn days by about 7.1 tons per winter day (assuming 75 percent rule effectiveness).

BCM-02 – Further Reductions from Open Burning [PM2.5]: Rule 444 outlines the criteria and guidelines for agricultural and prescribed burning, as well as training burns, to minimize PM emissions and smoke in a manner that is consistent with state and federal laws. Agricultural burning is open burning of vegetative materials produced from the growing and harvesting of crops. Prescribed burning is a planned open burning of vegetative materials, usually conducted by a fire protection agency and/or department of forestry, to promote a healthier habitat for plants and animals, to prevent plant disease and pests, and to reduce the risk of wild fires. Training burns are hands-on instructional events conducted by fire protection agencies on methods of preventing and/or suppressing fire. Rule 444 currently contains requirements that a no-burn day may be called under a combination of geographical, meteorological, and air quality conditions. This control measure would potentially increase the number of no-burn days by establishing an additional criteria for no-burn during episodic days as described in control measure BCM-01 by implementing a curtailment that would apply Basin-wide whenever a PM2.5 level of greater than 30 μg/m^3 is forecast at any monitoring station ~~at~~ which has recorded violations of the design value for the current PM2.5 24-hour standard of 35 μg/m^3 for either of the two previous three-year design value periods.~~the design value has exceeded the current PM2.5 24-hour standard of 35 μg/m3 for either of the two previous periods.~~ It should be noted that, as with the current mandatory program, the Basin-wide curtailment criteria will apply for the entire winter season, which is November through February. Under this measure, consideration will also be given to expanding the defined winter season to potentially include October and/or March. Enhancing the open burning restrictions with this new threshold criteria and applying a curtailment to the entire Basin could potentially reduce Basin-wide ambient PM2.5 concentrations on these episodic no-burn days by about 4.6 tons per winter day. Since the burning would likely be shifted to other days, the total annual emissions would remain the same, but would not occur on days where high PM2.5 levels are forecast.

BCM-03 – Emission Reductions from Under-Fired Charbroilers (Rule 1138) [PM2.5] (*formerly BCM-05 in the 2007 AQMP*) (*formerly* Control Measure BCM-01): This proposed measure seeks emission reductions by potentially requiring new and/or existing medium to large volume restaurants with under-fired charbroilers to install control devices meeting a minimum efficiency requirement. Under-fired charbroilers are responsible for the majority of emissions from restaurant operations – 84 percent of PM and 71 percent of VOC emissions. Several control options are currently being evaluated and tested including electrostatic precipitators (ESP), high efficiency particulate arresting (HEPA) filters, wet scrubbers, and thermal oxidizers. Under-fired charbroilers are one of the largest unregulated sources of directly emitted PM. This control measure will be implemented in two phases. Phase I will be the completion of the technical assessment at CE-CERT, including considerations for compatibility with existing restaurants and all applicable building and safety codes (e.g., fire suppression). Evaluation of cost and affordability associated with the purchase, installation, and operation and maintenance (e.g., cleaning and/or replacing filters) of the equipment will also be assessed.

A technical assessment of potential control technologies is currently ongoing at University of California, Riverside (CE-CERT), to evaluate the efficiency and the cost-effectiveness of various control devices for the capture and control of filterable and/or condensable forms of PM from under-fired charbroilers. The Bay Area AQMD adopted a rule for commercial cooking equipment that controls both chain-driven and under-fired charbroilers. The Bay Area measure will be evaluated to meet the all feasible measures requirement. A rule will be developed if deemed feasible. Technical and economic feasibility, as well as affordability of controls, particularly for existing restaurants relative to retrofit installation and operation/maintenance, will be considered in conjunction with any future rule development to establish requirements for under-fired charbroilers.

BCM-04 – Further Ammonia Reductions from Livestock Waste [Ammonia] (*formerly* MCS-05 in the 2007 AQMP) (*formerly* Control Measure MCS-04C): This measure seeks to reduce ammonia emissions from livestock operations with emphasis on dairies. This control measure would apply ~~only~~ primarily to the Mira Loma area, which further reduce PM2.5 emissions in the only area that currently exceeds the federal 24-hour PM2.5 standard. Existing Rule 1127 – Emission Reductions from Livestock Waste requires best management practices for dairies and specific requirements regarding manure removal, handling, and composting; however, the rule does not focus on fresh manure, which is one of the largest dairy sources of ammonia emissions.

This control measure will be implemented in two phases. Phase I will be to conduct a technical assessment of the aforementioned method of control. An assessment will be conducted to evaluate the use of sodium bisulfate (SBS) at local dairies to evaluate the technical and economic feasibility of its application. Reducing pH level in manure through the application of acidulant additives (acidifier), such as sodium bisulfate (SBS), is one of the potential mitigations for ammonia. SBS is currently being considered for use in animal housing areas where high concentrations of fresh manure are located. Research indicates that best results occur when SBS is used on "hot spots". SBS can also be applied to manure stock piles and at fencelines, and upon scraping manure to reduce ammonia spiking from the leftover remnants of manure and urine. A rule will be developed if deemed feasible. SBS application may be required seasonally or episodically during times when high ambient PM2.5 levels are forecast.

If deemed feasible and effective, Phase II would implement the measure as needed to address future PM2.5 standards. Rule requirements would be specific to dairies in the AQMD jurisdiction and may be unique to localized operations only.

CMB-01 – Further NOx Reductions from RECLAIM [NOx] – *Phase I*: ~~This proposed control measure will seek further reductions of 2 tpd of NOx allocations by 2014.~~ The proposed Phase

I reductions are designed to serve as a contingency measure. It would be implemented if the Basin does not attain the federal 24-hr PM2.5 standard by 2014. If necessary, Phase I is expected to be adopted in 2013 and the shave will be implemented/triggered for compliance year 2015 if the attainment of 24-hr PM2.5 standard is not met by 2014. In addition, staff would seek to identify appropriate approaches during rulemaking to implement the allocation shaving methodology. The control measure has the ability to produce co-benefits in the reduction of PM2.5 and ozone.

CMB-01 – Further Emission Reductions from NOx RECLAIM [NOx] – *Phase II*: This proposed NOx control measure ~~would seek further reductions in NOx allocations by the year~~ is expected to be adopted by 2015 for implementation between 2017 and 2020 to be consistent with the 2012 AQMP. If control measure CMB-01, RECLAIM Phase I, contingency measure emission reductions are not triggered and implemented, Phase II will target a cumulative three to five tons per day of NOx emission reductions. This phase of control is to implement periodic BARCT evaluation as required under state law. The control measure has the ability to produce co-benefits in the reduction of PM2.5 and ozone.

CMB-02 – NOx Reductions from Biogas Flares [NOx]: There are no source specific rules regulating NOx emissions from biogas flares. Flare NOx emissions are regulated through new source review and BACT. This control measure proposes that, consistent with the feasible measures, older biogas flares be gradually replaced with new flares that meet current BACT. Strategies that minimize flaring and associated emissions can also be considered as alternative control options.

CMB-03 – Reductions from Commercial Space Heating [NOx] (Rule 1111): This control measure would apply to space heaters used for comfort heating. SCAQMD Rule 1111 - NOx Emissions from Natural Gas-Fired Fan Type Central Furnaces, regulates natural gas-fired commercial space heaters with input rates less than 175,000 Btu/hr. This control measure is expected to reduce NOx emissions from affected heaters by reducing the NOx emission control limit for new space heaters for commercial applications, which can be achieved through the use of low-NOx burners or other low emitting combustion technologies.

CTS-01 – Further VOC Reductions from Architectural Coatings (Rule 1113) [VOC]: SCAQMD adopted Rule 1113 – Architectural Coatings, in 1977 and it has undergone numerous amendments. This proposed control measure seeks to reduce VOC emissions from large volume coating categories such as flat, non-flat and primer, sealer, undercoaters (PSU) and from phasing out the currently exempt use of high-VOC architectural coatings sold in one liter containers or smaller. Additional VOC emission reductions could be achieved from the application of architectural coatings by use of application techniques with greater transfer efficiency. Such transfer efficiency improvements could be achieved through the use of a laser paint targeting system, which has been shown to improve transfer efficiency on average by 30 percent over equipment not using a targeting system, depending on the size, shape and configuration of the substrate. The proposal is anticipated to be accomplished with a multi-phase adoption and implementation schedule.

CTS-02 – Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants [VOC]: This control measure seeks to reduce VOC emissions from miscellaneous coating, adhesive, solvent and lubricant categories by further limiting the allowable VOC content in formulations. Examples of the miscellaneous categories to be considered include, but are not limited to, coatings used in aerospace and marine applications; adhesives used in a variety of sealing applications; solvents for graffiti abatement activities; and lubricants used as metalworking fluids to reduce heat and friction to prolong the life of the tool, improve product quality, and carry away debris. Reductions would be achieved by lowering the VOC content of the coatings, adhesives and lubricants. For solvents, reductions could be achieved with the use of alternative low-VOC products or non-VOC product/equipment at industrial facilities. The proposal is anticipated to be accomplished with a multi-phase adoption and implementation schedule.

CTS-03 – Further VOC Reductions from Mold Release Products [VOC]: Metal, fiberglass, composite and plastic products are often manufactured using molds which form the part into a particular configuration. Mold release agents are used to ensure that the parts, as they are made, can be released easily and quickly from the molds. These agents are often blended with VOC solvent carriers and may also contain toxic components such as toluene and xylene. Mold release products are also used for concrete stamping operations to keep the mold from adhering to the fresh concrete. Residential and commercial concrete stamping is a rapidly growing industry and overall VOC emissions are estimated to be significant. This control measure would reduce VOC emissions from mold release products on metal, fiberglass, composite and plastic products, as well as concrete stamping operations, by requiring the use of low-VOC content mold release products.

CTS-04 – Further VOC Reductions from Consumer Products [VOC]: This control measure seeks to eliminate or revise the exemption for low vapor pressure solvents in CARB's consumer products regulation, which exempts low vapor pressure volatile organic compounds (LVP-VOC) from counting towards the compliance obligation for consumer product VOC limits. Recent testing conducted by the SCAQMD ~~District~~ on institutional cleaners found that traditionally formulated consumer products may contain significant amounts of LVP-VOC solvents. In some cases, such as certain multipurpose solvents, the products were 100 percent LVP-VOC solvents. Further testing indicated that many of the LVP-VOC solvents evaporate nearly as quickly as the traditional solvents they were meant to replace and have Maximum Incremental Reactivity (MIR) values well above the threshold considered to be non-reactive, currently based on ethane. Therefore, an evaluation of the continued need for use of LVP-VOC solvents in certain categories is warranted.

FUG-01 – ~~Further~~ VOC Reductions from Vacuum Trucks [VOC]: This control measure will primarily focus on high-emitting ~~seeks to reduce emissions from the further venting of~~ vacuum truck~~s~~ operations, such as those found in petrochemical industries and other operations that include the transfer of volatile liquids such as gasoline. Emissions from such operations can be reduced through the utilization of control technologies, including but not limited to, carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers and liquid scrubbers. Additionally, implementation of a leak detection and repair (LDAR) program may further reduce fugitive emissions.

FUG-02 – Emission Reduction from LPG Transfer and Dispensing [VOC]: In June 2012, the SCAQMD adopted phase I Rule 1177 - Liquefied Petroleum Gas (LPG) Transfer and

Dispensing. Rule 1177 requires use of low-emission fixed liquid level gauges or equivalent alternatives while filling LPG-containing tanks and cylinders, use of low-emission connectors, routine leak checks and repairs of LPG transfer and dispensing equipment. The purpose of Control Measure FUG-02 is to further reduce fugitive VOC emissions associated with the transfer and dispensing of LPG by expanding rule applicability to include LPG transfer and dispensing at currently exempted facilities such as refineries, marine terminals, natural gas processing plants and pipeline transfer stations, as well as facilities that conduct fill-by-weight techniques.

FUG-03 – Further ~~VOC~~ Reductions from Fugitive VOC Emissions [VOC]: This control measure would broaden the applicability of improved leak detection and repair (LDAR) programs to remove additional fugitive VOC emissions. Areas for further study may include, but are not limited to, Rule 1142 - Marine Vessel Tank Operations, and wastewater separators. This control measure would explore the opportunity of incorporating a recently developed advanced optical gas imaging technology to detect leaks (Smart LDAR) to more easily identify and repair leaks in a manner that is less time consuming and labor intensive. Additionally, vapor recovery systems are currently required to have a control efficiency of 95 percent. In an effort to further reduce VOC emissions from these types of operations, this control measure would explore opportunities and the feasibility of further improving the collection/control efficiency of existing control systems, resulting in additional VOC reductions.

MCS-01 – Application of All Feasible Measures Assessment [All Pollutants]: This control measure is to address the state law requirement for all feasible measures for ozone. Existing rules and regulations for pollutants such as VOC, NOx, SOx and PM typically reflect BARCT requirements at the time the rules or regulations were adopted or amended. However, BARCT continually evolves as feasible and cost-effective new technology becomes available or becomes more efficient. Through this proposed control measure, the SCAQMD would commit to the adoption and implementation of the new retrofit control technology standards. Finally, staff would review actions taken by other air districts for applicability in the district.

MCS-02 – Further Emission Reductions from Greenwaste Processing (Chipping and Grinding Not Associated with Composting) [VOC]: Chipped or ground greenwaste and/or woodwaste have the potential to emit VOCs when being stockpiled or land-applied for various purposes. Chipping and grinding is a process to mechanically reduce the size of greenwaste and woodwaste pieces. SCAQMD rules have established best management practices (BMPs) for greenwaste composting and related operations under Rule 1133.1 – Chipping and Grinding Activities, and Rule 1133.3 – Greenwaste Composting Operations. During rule development, stakeholders raised the need to develop a holistic approach to identifying and accounting for emissions from all greenwaste streams and reducing potential emissions from greenwaste material handling operations at chipping and grinding facilities and other related facilities, not just the ones associated with composting operations. This control measure would seek to establish additional BMPs for handling processed or unprocessed greenwaste material by greenwaste processors, haulers, and operators who inappropriately stockpile material or directly apply the material to land. The implementation of the control measure would be in two phases. ~~First~~In Phase 1, the existing database would be reviewed to refine greenwaste material inventory, and second, a rule would potentially be developed to incorporate technically feasible and cost-effective BMPs or controls. SCAQMD staff will work with counties and cities relative to green material handling practices in light of the aforementioned state diversion requirements and goals in order to determine green material end use and minimize any potential adverse impacts associated with implementing this measure.

In Phase 2, a rule would potentially be developed to incorporate technically feasible and cost-effective BMPs or controls. The SCAQMD will convene its working group involving all stakeholders to develop cost-effective and workable solutions for this source category.

MCS-03 – Improved Start-up, Shutdown and Turnaround Procedures [All Pollutants] (*formerly* MCS-06 in the 2007 AQMP): This proposed control measure seeks to reduce emissions during equipment startup, shutdown, and turnaround. Opportunities for further reducing emissions from start-up, shut-down and turnaround activities potentially exist at refineries as well as other industries. Examples of possible areas for improvement may include implementing BMPs, promoting better engineering and equipment design, diverting or eliminating process streams that are vented to flares, and installing redundant equipment to increase operational reliability. This measure will be implemented through a two-phase effort to first collect/refine emissions and related data and then, based on the data collected, assess viable controls, if appropriate.

IND-01 - Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Sources [**NOx, SOx, PM2.5**] **(*formerly* MOB-03 in the 2007 AQMP)**: This measure would be designed to ensure NOx, SOx and PM2.5 emissions reductions from port-related sources are sufficient to attain the 24-hour federal PM2.5 ambient air quality standard. If emission levels projected to result from the current regulatory requirements and voluntary reduction strategies specified by the Ports are not realized, the 24-hr federal PM2.5 ambient air quality standard may not be achieved. This control measure is designed to ensure that the necessary emission reductions from port-related sources projected in the 2012 AQMP milestone years are achieved or if it is later determined through a SIP amendment that additional region-wide reductions are needed due to the change in Basin-wide carrying capacity for PM2.5 attainment.

This measure is divided into two phases. The Phase I requirements are triggered if emission levels projected to result from the current regulatory requirements and voluntary reduction strategies that are assumed and relied upon in the 2012 AQMP are not realized. Once triggered, the ports will be required to develop and implement a plan to reduce emissions from their sources to meet the emission targets. Phase II is designed to reduce emissions if it is later determined through a SIP amendment that additional region-wide reductions are needed due to the change in Basin-wide carrying capacity for PM2.5 attainment. In this case, the ports will be required to further reduce their emissions on a “fair-share” basis.

INC-01: Economic Incentive Programs to Adopt Zero and Near-Zero Technologies [NOx]: The primary objective of this measure is to develop a program that promotes and encourages adoption and installation of cleaner, more efficient combustion equipment, such as boilers, water heaters and commercial space heating, through economic incentive programs subject to the availability of public funding. Incentives may include grants for new purchases of equipment as well as loan programs in areas where long-term cost savings from increased efficiency are achieved.

INC-02: Expedited Permitting and CEQA Preparation Facilitating the Manufacturing of Zero and Near-Zero Technologies [All Pollutants]: This proposed control measure is aimed at providing incentives for companies to manufacture zero and near-zero emission technologies locally, thus, populating the market, potentially lowering the purchase cost, and increasing demand. With availability and usage of such technologies, air quality benefits would be achieved. This proposed measure focuses on two elements: 1) processing the required air permit(s) in an expedited procedure; and 2) prioritizing the preparation, circulation and certification of any applicable CEQA document where the SCAQMD is the lead agency. A stakeholder process will be initiated to design the program and collaborate with other existing SCAQMD or local programs.

EDU-01: Further Criteria Pollutant Reductions from Education Outreach and Incentives [All Pollutants] (formerly MCS-02, MCS-03): This proposed control measure would provide educational outreach and incentives for consumers to contribute to clean air efforts. Examples include the usage of energy efficient products, new lighting technology, "super compliant" coatings, tree planting, and the use of lighter colored roofing and paving materials which reduce VOC or NOx by lowering the ambient temperature. In addition, this proposed measure intends to increase the effectiveness of energy conservation programs through public education and awareness as to the environmental effects and benefits from conservation. Finally, educational and incentive tools to be used include social comparison applications (e.g., lifestyle comparisons of personal energy use and efficiency), social media, and public/private partnerships.

2.8.2 Mobile Source Control Measures

This subsection describes SCAQMD staff's proposed control measures to be included in the 2012 AQMP to reduce mobile source emissions to provide progress in attaining the eight-hour ozone and one-hour ozone ambient air quality standards by 2022-2023. The §182 (e)(5) proposed implementation measures presented in this subsection are based upon a variety of control technologies that are commercially available and/or technologically feasible to implement in the next several years. The focus of these measures includes accelerated retrofits or replacement of legacy fleets of vehicles or equipment, acceleration of vehicle turnover through voluntary vehicle retirement programs, and greater use of cleaner fuels in the near-term. In the longer-term, in order to attain the federal ozone ambient air quality standard, there is a need to increase the penetration and deployment of near-zero and zero-emissions vehicles such as plug-in hybrids, battery-electric, and fuel cell vehicles; accelerate the penetration and use of cleaner fuels (either alternative fuels or new formulations of gasoline and diesel fuels); and obtain additional emission reductions from aircraft engines. As set forth in the descriptions of individual control measures in Table 2-4, some of the measures will likely require action by CARB, while some control measures recognize actions being taken by other agencies.

TABLE 2-4

Mobile Source Control Measures Categorized by Source Type

§182 (e)(5) PROPOSED IMPLEMENTATION 8-HOUR OZONE MEASURES - ON-ROAD MOBILE SOURCES				
CM Number	**Title**	**Adoption**	**Implementation Period**	**Reduction (tpd)**
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles [VOC, NOx, PM]	N/A	Ongoing	TBD [a]
ONRD-02	Accelerated Retirement of Older Light-Duty and Medium-Duty Vehicles [VOC, NOx, PM]	N/A	Ongoing	TBD [a]
ONRD-03	Accelerated Penetration of Partial Zero-Emission and Zero Emission Light Heavy-Duty Vehicles [NOx, PM]	N/A	Ongoing	TBD [a]
ONRD-04	Accelerated Retirement of Older Heavy-Duty Vehicles [NOx, PM]	N/A	Ongoing	TBD [a,b]
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards [NOx, PM]	2014	2015-2020	0.75 [NOx] 0.025 [PM2.5]
§182 (e)(5) Proposed Implementation 8-Hour Ozone Measures – Off-Road Mobile Sources				
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment [NOx]	N/A	Ongoing	7.5
OFFRD-02	Further Emission Reductions from Freight Locomotives [NOx, PM]	Ongoing	2015 -2023	12.7 [NOx] 0.32 [PM2.5]
OFFRD-03	Further Emission Reductions from Passenger Locomotives [NOx, PM]	Ongoing	Beginning 2014	3.0 [NOx] [c] 0.06 [PM2.5] [c]
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels While at Berth [NOx, PM]	N/A	Ongoing	TBD [a]
OFFRD-05	Emission Reductions from Ocean-Going marine Vessels [NOx]	N/A	Ongoing	TBD [a]
ADV-01	§182 (e) Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles [NOx]	N/A	2012 and on	TBD [d]
ADV-02	§182 (e) Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives [NOx]	N/A	2012 and on	TBD [d]
ADV-03	§182 (e) Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment [NOx]	N/A	2012 and on	TBD [d]
ADV-04	§182 (e) Proposed Implementation Measures for the Deployment of Cleaner Commercial Harborcraft [NOx]	N/A	2012 and on	TBD [d]

TABLE 2-4 (Concluded)

Mobile Source Control Measures Categorized by Source Type

§182 (e)(5) PROPOSED IMPLEMENTATION 8-HOUR OZONE MEASURES - ON-ROAD MOBILE SOURCES				
ADV-05	§182 (e) Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels [NOx]	N/A	2012 and on	TBD [d]
ADV-06	§182 (e) Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment [NOx]	N/A	2012 and on	TBD [d]
ADV-07	§182 (e) Proposed Implementation Measures for the Deployment of Cleaner Aircraft Engines [NOx]	N/A	2012 and on	TBD [d]

a) Emission reductions will be determined after projects are identified and implemented
b) Reductions achieved locally in Mira Loma region
c) Submitted into the SIP once technically feasible and cost effective options are confirmed
d) Emission reductions will be quantified after the projects are demonstrated.

2.8.2.1 Summaries of §182 (e)(5) Implementation 8-Hour Ozone Measures – On-Road Mobile Sources

By 2023, it is estimated that about 12 million vehicles will be operating in the Basin. To address emissions from these vehicles, SCAQMD staff is proposing five on-road mobile source control measures. The first two measures focus on on-road light- and medium-duty vehicles operating in the South Coast Air Basin, while the remaining three measures focus on heavy-duty vehicles. Summaries of each of the five on-road mobile source control measures are provided in the following paragraphs.

ONRD-01 – Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles [NOx]: This measure proposes to continue incentives for the purchase of zero-emission vehicles and hybrid vehicles with a portion of their operation in an "all electric range" mode. The state Clean Vehicle Rebate Pilot (CVRP) program is proposed to continue from 2015 to 2023 with a proposed funding for up to $5,000 per vehicle. The proposed measure seeks to provide funding assistance for up to 1,000 zero-emission or partial-zero emission vehicles per year.

ONRD-02 – Accelerated Retirement of Older Light-Duty and Medium-Duty Vehicles [NOx]: This proposed control measure calls for promoting the permanent retirement of older eligible vehicles through financial incentives currently offered through local funding incentive programs and the AB 118 Enhanced Fleet Modernization Program (EFMP). This~~e~~ proposed control measure seeks to retire up to 2,000 older light- and medium-duty vehicles (up to 8,500 lbs gross vehicle weight) per year. Funding incentives of up to $2,500 per vehicle are proposed for the scrapping of the vehicle, which may include a replacement voucher for a newer or new vehicle.

ONRD-03 – Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium Heavy-Duty Vehicles [NOx]: The objective of the proposed action is to accelerate the introduction of advanced hybrid and zero-emission technologies for Class 4 through 6 heavy-duty vehicles. The state is currently implementing a Hybrid Vehicle Incentives Project (HVIP) program to promote zero-emission and hybrid heavy-duty vehicles. This~~e~~ proposed control measure seeks to continue the program from 2015 to 2023 to deploy up to 1,000 zero- and partial-zero emission vehicles per year with up to $25,000 funding assistance per vehicle. Zero-emission vehicles and hybrid vehicles with a portion of their operation in an "all electric range" mode would be given the highest priority.

ONRD-04 – Accelerated Retirement of Older Heavy-Duty Vehicles [NOx]: This proposed control measure seeks to replace up to 1,000 heavy-duty vehicles per year with newer or new vehicles that at a minimum, meet the 2010 on-road heavy-duty NOx exhaust emissions standard of 0.2 g/bhp-hr. Given that exceedances of the 24-hour PM2.5 air quality standard occur in the Mira Loma region, priority will be placed on replacing older diesel trucks that operate primarily at the warehouse and distribution centers located in the Mira Loma area. Funding assistance of up to $35,000 per vehicle is proposed and the level of funding will depend upon the NOx emissions certification level of the replacement vehicle. In addition, a provision similar to the Surplus Off-Road Option for NOx (SOON) provision of the statewide In-Use Off-Road Fleet Vehicle Regulation will be sought to ensure that additional NOx emission reduction benefits are achieved.

ONRD-05 – Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards [NOx, PM]: This proposed control measure calls for a requirement that any cargo container moved between the Ports of Los Angeles and Long Beach to the nearby railyards (the Intermodal Container Transfer Facility and the proposed Southern California International Gateway) be with zero-emission technologies. This~~e~~ control measure would be fully implemented by 2020 through the deployment of zero-emission trucks or any alternative zero-emission container movement system such as a fixed guideway system. This~~e~~ control measure calls for CARB to either adopt a new regulation or amend an existing regulation to require such deployment by 2020. In lieu of a regulation or to complement a regulation, other enforceable mechanisms may achieve the objectives of the control measures. The Ports of Los Angeles and Long Beach have successfully implemented the Clean Truck Program as mentioned above. A second phase of such a program could be implemented to bring zero-emission trucks or hybrid trucks with sufficient all electric range to serve the near-dock railyards. In addition, incentives funding programs will encourage the deployment of such zero-emission trucks. To the extent the measure can feasibly be extended beyond near-dock railyards, this would be considered for adoption by CARB.

2.8.2.2 §182 (e)(5) Implementation 8-Hour Ozone Measures – Off-Road Mobile Sources

SCAQMD staff is proposing five control measures that seek further emission reductions from off-road mobile sources and industrial equipment. Off-road mobile sources such as aircraft, locomotives, and marine vessels are principally regulated by federal and state agencies. In addition, several of the off-road mobile source control measures include certain local actions that can result in emission reductions beyond the emissions standard setting authority of the state and EPA. Summaries of each of the five off-road mobile source control measures are provided in the following paragraphs.

OFFRD-01 – Extension of the SOON Provision for Construction/Industrial Equipment [NOx]: This control measure seeks to continue the Surplus Off-Road Option for NOx (SOON) provision of the statewide In-Use Off-Road Fleet Vehicle Regulation beyond 2014 through the 2023 timeframe. In order to implement the SOON program in this timeframe, funding of up to $30 million per year would be sought to help fund the repower or replacement of older Tier 0 and Tier 1 equipment, with reductions that are considered surplus to the statewide regulation with Tier 4 or cleaner engines.

OFFRD-02 – Further Emission Reductions from Freight Locomotives [NOx]: This~~e~~ proposed control measure carries forward the freight locomotive control measures from ~~is to meet the commitment in~~ the 2007 SIP. This control measure calls for replacing existing locomotive engines with ~~the accelerated use of~~ Tier 4 locomotives in the South Coast Air Basin. This~~e~~ control measure calls for CARB to seek further emission reductions from freight locomotives through enforceable mechanisms within its authority to achieve 95 percent or greater introduction of Tier 4 locomotives by 2023.

OFFRD-03 – Further Emission Reductions from Passenger Locomotives [NOx]: This control measure recognizes the recent actions by the Southern California Regional Rail Authority (SCRRA or Metrolink) to consider replacement of their existing Tier 0 passenger locomotives with Tier 4 locomotives. The SCRRA adopted a plan that contains a schedule to replace their older existing passenger locomotives with Tier 4 locomotives by 2017. More recently, SCRRA released a Request for Quotes on the cost of new or repowered passenger locomotives with locomotive engines that meet Tier 4 emission levels.

OFFRD-04 – Further Emission Reductions from Ocean-Going Marine Vessels While at Berth [NOx]: This control measure seeks additional emission reductions from ocean-going marine vessels while at berth. The actions would affect ocean-going vessels that are not subject to the statewide Shorepower Regulation or vessel calls that are considered surplus to the statewide regulation. This~~e~~ control measure seeks at a minimum to have an additional 25 percent of vessel calls beyond the statewide regulation to deploy shorepower technologies or alternative forms of emissions reduction as early as possible. Such actions could be implemented through additional incentives programs or through the San Pedro Bay Ports as part of the implementation of the Ports Clean Air Action Plan.

OFFRD-05 – Emission Reductions from Ocean-Going Marine Vessels [NOx]: This control measure recognizes the recent actions at the Ports of Los Angeles and Long Beach to initiate an incentives program for cleaner ocean-going vessels to call at the ports. The program has been initiated as part of the San Pedro Bay Ports Clean Air Action Plan. The program will provide financial incentives for cleaner Tier 2 and Tier 3 ocean-going vessels to call at the ports. This control measure also recognizes the need to monitor progress under such programs and augment them as necessary to ensure sufficient results. The program will be monitored on annual basis and, if necessary, any adjustments to the program will be made.

§182 (e)(5) Implementation to Deploy Advanced Control Technologies

SCAQMD staff is also proposing the following seven additional §182 (e) proposed implementation control measures to deploy the cleanest control technologies as early as possible and the development, demonstration, and deployment of near-zero and zero-emission technologies. Many of these actions have already begun. However, additional research and development will be needed that will lead to commercial development of control technologies that achieve emission levels below current adopted emission standards. Other near-zero and zero-emission technologies that are commercially available will require infrastructure development to facilitate their deployment.

ADV-01 – §182 (e)(5) Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles [NOx] This control measure would continue the efforts underway to develop zero-emission and near-zero emission technologies for on-road heavy-duty vehicle applications. Such technologies include, but are not limited to, fuel cell, battery-electric, hybrid-electric with all electric range, and overhead catenary systems. Hybrid-electric systems incorporate an engine powered by conventional fuels or alternative fuels such as natural gas. The actions provided in this~~e~~ proposed control measure are based on the SCAG 2012 Regional Transportation Plan.

ADV-02 – §182 (e)(5) Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives [NOx] This control measure calls for the development and deployment of zero-emission and near-zero emission technologies for locomotives. Such technologies include overhead catenary systems, hybrid locomotives that have some portion of their operation in an "all electric range" mode, and alternative forms of external power such as a battery tender car. The actions provided in this~~e~~ proposed control measure are based on the SCAG 2012 Regional Transportation Plan. The zero-emission technologies could apply to freight and passenger locomotives.

ADV-03 – §182 (e)(5) Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment [NOx] This control measure recognizes the actions underway to develop and deploy zero- and near-zero emission technologies for various cargo handling equipment. The San Pedro Bay Ports are currently demonstrating battery-electric yard tractors. In addition, battery-electric, fuel cell, and hybridized systems could be deployed on smaller cargo handling equipment. In addition, the use of alternative fuels for conventional combustion engines could potentially result in greater emissions benefits.

ADV-04 – §182 (e)(5) Proposed Implementation Measures for the Deployment of Cleaner Commercial Harborcraft [NOx] Several commercial harbor craft operators have begun deployment of hybrid systems in their harbor craft to further reduce criteria pollutant emissions and improve fuel efficiency. Other cleaner technologies include the use of alternative fuels, retrofit of existing older marine engines with selective catalytic converters, and diesel particulate filters. This control measure recognizes several efforts between the SCAQMD ~~District~~ and the Ports of Los Angeles and Long Beach to further demonstrate control technologies that could be deployed on commercial harbor craft that could go beyond the statewide Harbor Craft Regulation.

ADV-05 – §182 (e)(5) Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels [NOx] The Ports of Los Angeles and Long Beach, CARB, and the SCAQMD ~~District~~ have sponsored research and demonstration of various control technologies to further reduce emissions from ocean-going vessels. In addition, the

San Pedro Bay Ports Clean Air Action Plan contains a measure to further demonstrate such technologies on ocean-going vessels. This control measure recognizes many of these efforts and the need to further demonstrate retrofit technologies on existing ocean-going vessels.

ADV-06 – §182 (e)(5) Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment [NOx] The SCAQMD's ~~District,~~ Mobile Source Air Pollution Reduction Review Committee (MSRC), and CARB have been conducting an off-road "showcase" program for retrofit technologies to further reduce emissions from older off-road equipment. In addition, several major off-road engine manufacturers are investigating the potential use of hybrid systems to further reduce criteria pollutant and greenhouse gas emissions. Potential advanced technologies include hybrid systems that utilize batteries, fuel cells, or plug-in capabilities, which could result in lower emissions compared to Tier 4 emission levels when combined with future Tier 4 compliant engines. Thise control measure will be ~~is~~ implemented by the SCAQMD~~District~~, CARB and U.S. EPA.

ADV-07 – §182 (e)(5) Proposed Implementation Measures for the Deployment of Cleaner Aircraft Engines [NOx] This control measure recognizes the efforts of the Federal Aviation Administration's Continuous Lower Energy, Emissions and Noise (CLEEN) Program. The goal of the CLEEN Program is the development of new aircraft engines that potentially can be up to 60 percent cleaner in NOx emissions than current aircraft engines. The actions under this control measure are to continue the development of cleaner aircraft engines and work with the airlines and local airport authorities to develop mechanisms to route the cleanest aircraft to serve the South Coast Air Basin.

2.8.3 Transportation Control Measures from the Southern California Association of Governments 2012 – 2035 Regional Transportation Plan and Sustainable Communities Strategy

The Southern California Association of Governments (SCAG), the Metropolitan Planning Organization (MPO) for Southern California, is mandated to comply with federal and state transportation and air quality regulations. Further, pursuant to California Health and Safety Code (HSC) §40460, SCAG has the responsibility of preparing and approving the portions of the AQMP related to regional demographic projections and integrated regional land use, housing, employment, and transportation programs, measures, and strategies. The SCAQMD combines its portion of the AQMP with those portions prepared by SCAG and required by HSC §40460.

The transportation strategy and transportation control measures (TCMs) to be included as part of the 2012 PM2.5 AQMP and SIP for the South Coast Air Basin, as defined in the Health and Safety Code, are based on SCAG's adopted 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and 2011 Federal Transportation Improvement Program (FTIP), which were developed in consultation with federal, state and local transportation and air quality planning agencies and other stakeholders. A list of the TCMs from the 2012-2035 RTP/SCS can be found in Appendix E of the Final Program EIR and Appendix B of the recirculated NOP/IS.

The 2012 – 2035 Regional Transportation Strategy and Transportation Control Measures portion of the 2012 AQMP/SIP consists of the following three related sections.

- Section I. Linking Regional Transportation Planning to Air Quality Planning: As required by federal and state laws, SCAG is responsible for ensuring that the regional transportation plan, program, and projects are supportive of the goals and objectives of AQMPs/SIPs. SCAG is also required by state law to develop demographic projections and regional transportation strategy and control measures for the AQMPs/SIPs. SCAG prepares the RTP/SCS, which is updated every four years, and the Federal Transportation Improvement Plan biennially.
- Section II. Regional Transportation Strategy and Transportation Control Measures: The 2012-2035 RTP/SCS was formally adopted by the SCAG Regional Council on April 4, 2012. The 2012-2035 RTP/SCS contains a host of improvements to every component of the regional multimodal transportation system including:
  - ❑ Active transportation (non-motorized transportation, such as biking and walking)
  - ❑ Transportation demand management (TDM)
  - ❑ Transportation system management (TSM)
  - ❑ Transit
  - ❑ Passenger and high-speed rail
  - ❑ Goods movement
  - ❑ Aviation and airport ground access
  - ❑ Highways
  - ❑ Arterials
  - ❑ Operations and maintenance

Included within these transportation system improvements are projects that reduce vehicle use or change traffic flow or congestion conditions ("TCMs"). TCMs include the following three main categories of transportation improvement projects and programs:

- High occupancy vehicle (HOV) measures,
- Transit and systems management measures, and
- Information-based transportation strategies.
- Section III. Reasonably Available Control Measure Analysis: As required by the CAA, a RACM analysis must be included as part of the overall control strategy in the AQMP/SIP to ensure that all potential control measures are evaluated for implementation and that justification is provided for those measures that are not implemented. Based on this comprehensive review, it is determined that the TCMs being implemented in the South Coast Air Basin are inclusive of all TCM RACM. None of the candidate measures reviewed and determined to be infeasible meets the criteria for RACM implementation.

The 2012-2035 RTP/SCS was formally adopted by the SCAG Regional Council on April 4, 2012. In conjunction with preparing the 2012-2035 RTP/SCS, SCAG also prepared a 2012 Final Program EIR (State Clearinghouse #2011051018) for the 2012-2035 RTP/SCS to evaluate potential impacts from the project at the program level. Potential adverse impacts from implementing the TCMs were also evaluated in the 2012 AQMP Final Program EIR. The Final Program EIR for the 2012 AQMP will rely on the environmental analyses in SCAG's 2012 Final Program EIR for the 2012-2035 RTP/SCS for the evaluation of the environmental impacts of implementing the TCMs. Environmental impacts from implementing the TCMs will be addressed in the ~~Draft~~ Final Program EIR for the 2012 AQMP under cumulative impacts.

2.8.4 Coordination with the State's Greenhouse Gas Reduction Efforts

The Basin faces several ozone and PM attainment challenges, as strategies for significant emission reductions become harder to identify and the federal standards continue to become more stringent. California's Greenhouse Gas reductions targets under AB32 add new challenges and timelines that affect many of the same sources that emit criteria pollutants. In finding the most cost-effective and efficient path to meet multiple deadlines for multiple air quality and climate objectives, it is essential that an integrated planning approach is developed. Responsibilities for achieving these goals span all levels of government, and coordinated and consistent planning efforts among multiple government agencies are a key component of an integrated approach.

To this end, and concurrent with the development of the 2012 AQMP, the SCAQMD~~District~~, ~~the Air Resources Board~~CARB, and San Joaquin Valley Air Pollution Control District engaged in a joint effort to take a coordinated and integrated look at strategies needed to meet California's multiple air quality and climate goals, as well as its energy policies. California's success in reducing smog has largely relied on technology and fuel advances, and as health-based air quality standards are tightened, the introduction of cleaner technologies must keep pace. More broadly, a transition to zero- and near-zero emission technologies is necessary to meet 2023 and 2032 air quality standards and 2050 climate goals. Many of the same technologies will address air quality, climate and energy goals. As such, strategies developed for air quality and climate change planning should be coordinated to make the most efficient use of limited resources and the time needed to develop cleaner technologies. The product of this collaborative effort, the draft Vision for Clean Air: A Framework for Air Quality and Climate Planning, examines how those technologies can meet both air quality and climate goals over time. A public review draft of this document is now available at http://www.aqmd.gov/aqmp/2012aqmp/ and serves as context and a resource for the 2012 AQMP.

2.8.5 Ultrafine Particles

The ~~Draft~~ 2012 AQMP also includes a discussion of the emerging issues of ultrafine particle and near-roadway exposures. There is growing concern about the potential health effects as caused by exposure for people living near major roadways to criteria pollutants and air toxics emitted from both gasoline and diesel vehicles (HEI, 2010). Recent toxicological and epidemiological studies have identified living near major roadways as a risk factor for respiratory and cardiovascular problems and other health related issues. These very minute particles (consisting primarily of organic material, soot, and trace elements) have a different chemical composition than the larger PM fractions (PM2.5 and PM10). Due to their small size, UFPs can penetrate deeply into the human respiratory tract, into the blood stream, and be transported to other critical organs such as the heart and brain. Furthermore, their large surface area may provide a mechanism for delivering potentially toxic adsorbed material into the lung and other organs.

UFPs are emitted from almost every fuel combustion process, including diesel, gasoline, and jet engines, as well as external combustion processes such as wood burning. Consequently, there is growing concern that people living in close proximity to highly trafficked roadways and other sources of combustion-related pollutants (e.g., airports and rail yards) may be exposed to significant levels of UFPs and other air toxics.

Over the last decade, substantial efforts have been made to better characterize the physical and chemical properties of UFPs and their potential impact on people living in close proximity to roadways and other emissions sources. Two areas of research have received particular attention:

- On-roadways, near-roadways, and in-vehicle measurements
- Effect of UFP reduction technologies

From a regulatory perspective, the U.S. focus has been on reducing the mass of PM emitted in the ambient air. However, UFPs contribute a very small portion of the overall atmospheric particle mass concentration. Thus, there has been growing interest over the last two decades to study, understand, and regulate the size and number of particles found in PM generated from diesel and other combustion engines. Partly because light-duty diesel vehicles are very common in European countries, the European Union has already adopted standards that phase in particle number limits for passenger car and light-duty vehicle emissions. However, there are still concerns related to the health impacts of non-solid organic UFP components that are not addressed by the European solid particle number standard.

Recently, CARB staff prepared a preliminary discussion paper on proposed amendments to California's Low-Emission Vehicle (LEV III) Regulations, to address UFP emissions from light-duty motor vehicles by promoting a solid particle number based PM compliance strategy (CARB, 2010)[4]. CARB staff ultimately decided that the complexity of the issues warranted further study and understanding before proceeding. Although the SCAQMD ~~District~~ has limited authority to regulate mobile source pollution in the near-roadway environment, SCAQMD ~~District~~ staff has implemented a variety of measures to assess and reduce the health impacts of near-roadway emissions on local communities. The SCAQMD ~~District~~ continues to demonstrate and incentivize the deployment of zero/near-zero emission technology, has implemented numerous installations of high-efficiency air filtration in schools, and conducts outreach and education on near-roadway health impacts. Furthermore, on July 1, 2012 the SCAQMD ~~District~~ began the next Multiple Air Toxics Exposure Study (MATES IV) to characterize the carcinogenic risk from exposure to air toxics in the Basin. A new focus of

4 http://www.arb.ca.gov/msprog/levprog/leviii/meetings/051810/pm_disc_paper-v6.pdf

MATES IV will be the inclusion of measurements of UFP and BC concentrations across the Basin, and near specific combustion sources (e.g., airports, freeways, rail yards, busy intersections, and warehouse operations) to evaluate the long- and short-term exposures to these pollutants.

Environmental impacts from implementing potential control, mitigation, and policy strategies for limiting exposures to ultrafine particles will be addressed in the ~~Draft~~ Final Program EIR for the 2012 AQMP under cumulative impacts.

2.9 PROJECT OBJECTIVES

CEQA Guidelines §15124 (b) requires an EIR to include a statement of objectives, which describes the underlying purpose of the proposed project. The purpose of the statement of objectives is to aid the lead agency in identifying alternatives and the decision-makers in preparing a statement of findings and a statement of overriding considerations, if necessary. The objectives of the proposed 2012 AQMP are summarized in the following points.

1. Reduce PM2.5 nonattainment pollutants and their precursors on an expeditious implementation schedule;
2. Demonstrate attainment of the 24-hour PM2.5 national ambient air quality standard at the earliest possible date;
3. Reduce population exposure to PM2.5 by achieving the 24-hour PM2.5 national ambient air quality standard;
4. Continue making expeditious progress towards attaining the federal eight-hour ozone standard and demonstrate attainment of the federal one-hour ozone standard (revoked) by 2022 – 2023;
5. Reduce population exposure to ozone through continued progress towards attaining the federal one-hour (revoked) and eight-hour ozone standards by 2022 – 2023;
6. Reduce nonattainment pollutants at a rate of five percent per year, or include all feasible measures and an expeditious adoption schedule;
7. Update planning assumptions and the best available information such as SCAG's 2012 RTP, CARB's latest EMFAC2011 for the on-road mobile source emissions inventory, and CARB's OFF-ROAD 2011 model;
8. Update emission inventories using 2008 as the base year and incorporate emission reductions achieved from all applicable rules and regulations and the latest demographic forecasts;
9. Update any remaining control measures from the 2007 AQMP and incorporated into the 2012 AQMP as appropriate;
10. Compliance with federal contingency measure requirements;

11. Continue to work closely with businesses and industry groups to identify the most cost-effective and efficient path to meeting clean air goals while being sensitive to their economic concerns.

CHAPTER 3.0

EXISTING SETTING

Existing Setting

3.0 EXISTING SETTING

CEQA Guidelines §15360 (Public Resources Code Section 21060.5) defines "environment" as "the physical conditions that exist within the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance." According to CEQA Guidelines §15125 (a), a CEQA document must include a description of the physical environment in the vicinity of the project, as it exists at the time the Notice of Preparation (NOP) is published from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to provide an understanding of the significant effects of the proposed project and its alternatives. Since this CEQA document is a programmatic EIR that covers the SCAQMD's entire jurisdiction, the existing setting for each category of impact is described on a regional level.

The following subchapters describe the existing environmental setting for those environmental areas identified in the Initial Study (see Appendix A) that could be adversely affected by the proposed project. These areas include the following topics: aesthetics; air quality; energy; hazards and hazardous materials; hydrology and water quality; land use and planning; noise; solid and hazardous waste ~~management~~; and, transportation and traffic.

SUBCHAPTER 3.1

AESTHETICS

3.1 AESTHETICS

3.1.1 Introduction

The 2012 AQMP control measures could potentially create projects that can affect the visual character quality within the district. Specifically, on-road mobile source control measures that include electrification of trucks using a catenary (overhead-wired) system have the potential to adversely affect scenic resources such as scenic highways. Therefore, an overview of existing aesthetic resources, including scenic highways and coastal zones within the district, is provided in this subchapter.

3.1.2 Regulatory Setting

3.1.2.1 Federal

Aesthetic resources on federal lands are managed by the federal government using various visual resource management programs, depending on the type of federal land and/or the federal agency involved with a given project. Examples of federal visual resource management programs include the Visual Resource Management System utilized by the Federal Bureau of Land Management (BLM) and the Visual Management System utilized by the United States Forest Service (USFS).

3.1.2.2 State

3.1.2.2.1 California Coastal Act

The California Coastal Act of 1976 was enacted to regulate development projects within California's Coastal Zone. The act includes requirements that protect views and aesthetic resources through siting and design control measures, which are typically implemented at the local planning level through local coastal programs (LCPs) or land use plans (LUPs). According to the California Coastal Act:

> *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting (California Public Resources Code. California Coastal Act [Chapter 3 (Coastal Resources Planning and Management Policies) Article 6, Section 30251]).*

For local jurisdictions that do not have an approved LCP, regulation of development projects within the coastal zone remains under the jurisdiction of the California Coastal Commission (CCC).

3.1.2.2.2 State Scenic Highway Program

California's Scenic Highway Program was created by the California Legislature in 1963 to preserve and protect scenic highway corridors from change that would diminish the aesthetic value of land adjacent to those highways. When a city or county nominates an eligible scenic highway for official designation, it must adopt ordinances to preserve the scenic quality of the corridor or document such regulations that already exist in various portions of local codes. These ordinances make up the scenic corridor protection program.

Scenic corridor protection programs include policies intended to preserve the scenic qualities of the highway corridor, including regulation of land use and density of development, detailed land and site planning, control of outdoor advertising (including a ban on billboards), careful attention to and control of earthmoving and landscaping, and careful attention to design and appearance of structures and equipment (California Streets and Highways Code §260 et seq.).

3.1.2.3 Local

3.1.2.3.1 Counties and Cities

The geographic area encompassed by the district includes numerous cities and unincorporated communities in the counties of Los Angeles, Orange, San Bernardino, and Riverside. Each of these counties and incorporated cities has prepared a general plan, which is the primary document that establishes local land use policies and goals. Many of these general plans also establish local policies related to aesthetics and the preservation of scenic resources within their communities or subplanning areas, and may include local scenic highway programs.

3.1.2.3.2 Local Coastal Programs

The CCC and the local governments along the coast share responsibility for managing the state's coastal resources. Through coordination with the CCC, coastal cities and counties develop LCPs. These programs are the primary means for carrying out the policies of the California Coastal Act at the local level. In general, these policies are intended to promote public access and enhance recreational use of the coast as well as protection of natural resources in the coastal zone. Examples of counties, cities and local jurisdictions within the district that do have an approved LCP or LUP include Los Angeles County and the County of Orange and the cities of Santa Monica, El Segundo, Manhattan Beach, Hermosa Beach, Redondo Beach, Palos Verdes Estates, Rancho Palos Verdes, Long Beach, Avalon, Huntington Beach, Newport Beach, Irvine, Laguna Beach, Laguna Niguel, Dana Point, and San Clemente.

Following approval by the CCC, an LCP is certified and the local governments implement the programs. LCPs include two main components, a Land Use Plan and an Implementation Plan. These components may include policies or regulations that apply to preservation of visual and scenic resources within the coastal zone. Typically, these policies relate to preservation of views of the coast.

3.1.3 Environmental Setting

This environmental setting subchapter describes the aesthetics resources settings that may be adversely affected by the proposed project. Specifically, this environmental setting subchapter describes visual character and quality, visual resources, scenic highways, and coastal zones within the district.

3.1.3.1 Visual Character and Quality

Visual character and quality are defined by the built and natural environment. The ***visual character*** of a view is descriptive cataloguing of underlying landforms and landcover including the topography, general land use patterns, scale, form, and the presence of natural areas. Urban features, such as structures, roads, utility lines, and other development associated with human activities also help to define visual character. ***Visual quality*** is an evaluative appraisal of the aesthetics of a view and is established using a well-established approach to visual analysis adopted from the Federal Highway Administration (FHWA) based upon the relative degree of vividness, intactness, and unity found within the visual setting, as defined in the following bullet points (FHWA, 1981).

- Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive patterns.
- Intactness is the visual integrity of the landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, as well as in natural settings.
- Unity is the degree to which the visual resources of the landscape join together to form a coherent, harmonious visual pattern. Unity refers to the compositional harmony or inter-compatibility between landscape elements.

Each of the three criteria is independent and intended to evaluate one aspect of visual quality; however, no one criterion considered alone equates to visual quality.

The perception of visual quality can vary significantly among viewers depending on their level of visual sensitivity (interest). Sensitive viewers' perceptions can vary seasonally and even hourly as weather, light, shadow, and the elements that compose the viewshed change. Form, line, color, and texture are the basic components used to describe visual character and quality for most visual assessments (FHWA, 1981). Sensitivity depends upon the length of time the viewer has access to a particular view. Typically, residential viewers have extended viewing periods and are often concerned about changes in views from their homes. Visual sensitivity is, therefore, considered to be high for neighborhood residential areas. Visual sensitivity is considered to be less important for commuters and other people driving along surrounding streets. Views from vehicles are generally more fleeting and temporary, yet under certain circumstances are sometimes considered important (e.g., viewers who are driving for pleasure, views/vistas from scenic corridors).

As discussed in the Subchapter 3.1 - Aesthetics, of the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan (RTP) Final Environmental

Impact Report (FEIR), various jurisdictions within the SCAG region, which includes the jurisdiction of SCAQMD such as cities, counties, and federal or regional agencies, provide guidelines regarding the preservation and enhancement of visual quality in their plans or regulations[1]. An example of such guidance is the Caltrans Scenic Highway Visual Quality Program Intrusion Examples, which are presented in Table 3.1-1. As the table illustrates, a given visual element may be considered desirable or undesirable, depending on design, location, use, and other considerations. Because of the size and diversity of the area within the SCAQMD's jurisdiction, it is not possible to apply uniform standards to all areas within the district.

TABLE 3.1-1

Caltrans Scenic Highway Program – Examples of Visual Quality Intrusions

Minor Intrusion	Moderate Intrusion	Major Intrusion
Buildings: *Residential, Commercial, and Industrial Developments*		
Widely dispersed buildings. Natural landscape dominates. Wide setbacks and buildings screened from roadway. Forms, exterior colors and materials are compatible with landscape. Buildings have cultural or historical significance.	Increased numbers of buildings, not well integrated into the landscape. Smaller setbacks and lack of roadway screening. Buildings do not dominate the landscape or obstruct scenic view.	Dense and continuous development. Highly reflective surfaces. Buildings poorly maintained. Visible blight. Development along ridgelines. Buildings dominate the landscape or obstruct scenic view.
Unsightly Land Uses: *Dumps, Quarries, Concrete Plants, Tank Farms, Auto Dismantling*		
Screened from view so that most of facility is not visible from the highway.	Not screened and visible but programmed/funded for removal and site restoration. Land use is visible but does not dominate the landscape or obstruct scenic view.	Not screened and visible by motorists. Will not be removed or modified. Land use dominates the landscape or obstructs scenic view.
Commercial Retail Development		
N/A	Neat and well landscaped. Single story. Generally blends with surroundings. Development is visible but does not dominate the landscape or obstruct scenic view.	Not harmonious with surroundings. Poorly maintained or vacant. Blighted. Development dominates the landscape or obstructs scenic view.

1 California cities and counties are not required to include visual quality elements in their General Plans although many do. However, the General Plans are required to include a Conservation Element, which includes resources such as waterways and forests that frequently are also scenic resources.

TABLE 3.1-1 (Continued)

Caltrans Scenic Highway Program – Examples of Visual Quality Intrusions

Minor Intrusion	Moderate Intrusion	Major Intrusion
Parking Lots		
Screened from view so that most of the vehicles and pavement are not visible from the highway.	Neat and well landscaped. Generally blends with surroundings. Pavement and/or vehicles visible but do not dominate the landscape or degrade scenic view.	Not screened or landscaped. Pavement and/or vehicles dominate the landscape or degrade scenic view.
Off-Site Advertising Structures		
N/A	N/A	Billboards degrade or obstruct scenic view.
Noise Barriers		
N/A	Noise barriers are well landscaped and complement the natural landscape. Noise barriers do not degrade or obstruct scenic view.	Noise barriers degrade or obstruct scenic view.
Power Lines and Communication Facilities		
Not easily visible from road.	Visible, but do not dominate scenic view.	Towers, poles or lines dominate view. Scenic view is degraded.
Agriculture: *Structures, Equipment, Crops*		
Generally blends in with scenic view. Is indicative of regional culture.	Not compatible with the natural landscape. Scale and appearance of structures and equipment visually competes with natural landscape.	Scale and appearance of structures and equipment are incompatible with and dominates natural landscape. Structures, equipment or crops degrade or obstruct scenic view.
Exotic Vegetation		
Used as screening and landscaping. Generally is compatible with scenic view.	Competes with native vegetation for visual dominance.	Incompatible with and dominates natural landscape. Scenic view is degraded.
Clearcutting		
N/A	Clearcutting or deforestation is evident, but is in the distant background.	Clearcutting or deforestation is evident. Scenic view is degraded.
Erosion		
Minor soil erosion (i.e., rill erosion).	Rill erosion starting to form gullies.	Large slip outs and/or gullies with little or no vegetation. Scenic view is degraded.

TABLE 3.1-1 (Concluded)

Caltrans Scenic Highway Program – Examples of Visual Quality Intrusions

Minor Intrusion	Moderate Intrusion	Major Intrusion
Grading		
Grading generally blends with adjacent landforms and topography.	Some changes, less engineered appearance and restoration are taking place.	Extensive cut and fill. Unnatural appearance, scarred hillsides or steep slopes with little or no vegetation. Canyons filled in. Scenic view is degraded.
Road Design		
Blends in and complements scenic view. Roadway structures are suitable for location and compatible with landscape.	Large cut and fill slopes are visible. Scale and appearance of roadway, structures, and appurtenances are incompatible with landscape.	N/A

Source: Caltrans, 2008

The *viewshed* can be defined as all of the surface area visible from a particular location or sequence of locations, and is described in terms of the dominance of landforms, landcover, and manmade development constituting visual character. Views of high visual quality in urban settings generally have several of the following additional characteristics:

- Harmony in scale with the surroundings;
- Context sensitive architectural design; and,
- Impressive landscape design features.

Areas of medium visual quality have interesting forms but lack unique architectural design elements or landscape features. Areas of low visual quality have uninteresting features and/or undistinguished architectural design and /or other common elements.

3.1.3.2 Visual Resources

Visual resources include historic buildings that uniquely identify a setting, views identified as significant in local plans, and/or views from scenic highways. The importance of a view to viewers is related to the position of the viewers relative to the resource and the distinctiveness of a particular view. The visibility and visual dominance of landscape elements are usually described with respect to their placement in the viewshed.

Visual resources occur in a diverse array of environments within the boundaries of the district, ranging in character from urban centers to rural agricultural land, natural woodlands, and coastal views. The extraordinary range of visual features in the region is afforded by the mixture of climate, topography, flora, and fauna found in the natural environment, and the diversity of style, composition, and distribution of the built environment. Views of the coast from locations in Los Angeles and Orange counties are considered valuable visual resources, while views of various mountain ranges are prevalent throughout the district. Other natural features that may be visually significant in the district include rivers, streams, creeks, lakes, and reservoirs.

The County of Los Angeles General Plan identifies regional open space and recognized scenic areas, generally including the Santa Monica Mountains, as well as the San Gabriel Mountains, Verdugo Hills, Santa Susana Mountains, Simi Hills, Santa Monica Mountains, and Puente Hills. In addition, ridgelines and hillsides are generally considered to be scenic resources, with specific measures for the protection of these areas (LA County, 2010).

The County of Orange General Plan identifies the Santa Ana Mountains along with their distinctive twin peaks known as "Saddleback" as the county's signature landmark. The Plan designates 10 scenic "viewscape corridors," which include among others Pacific Coast Highway, Oso Parkway, Ortega Highway, Jamboree Road, Santiago Canyon Road, and Laguna Canyon Road. These designated viewscape corridors provide scenic views of the Santa Ana Mountains, Lomas de Santiago and the San Joaquin Hills, as well as numerous canyons and valleys including the Santa Ana Canyon, Capistrano Valley, Laguna, Aliso, Wood, Moro, San Juan, Trabuco Santiago, Modjeska, Silverado, Limestone, and Black Star Canyons. Finally, the General Plan identifies nearly 42 miles of coastline and approximately 33 miles of sandy beaches as defining scenic resources (Orange County, 2011).

The County of Riverside General Plan identifies regional scenic resources, including Santa Ana River basin, Lake Mathews, Lake Perris, Lake Elsinore, Lake Skinner, Vail Lake, the San Jacinto River, Murrieta Creek, the Santa Margarita River, the vineyard/citrus region near Temecula, the Diamond Valley Reservoir, Joshua Tree National Park, Whitewater River, the Santa Rosa Mountains, and a portion of the Salton Sea (Riverside County, ~~2011~~2009).

The County of San Bernardino General Plan identifies several scenic areas, including the San Gabriel Mountains, the San Bernardino Mountains, La Loma Hills, Jurupa Hills, Chino Hills, Yucaipa Hills, Holcomb Valley, and the Mojave Desert. In addition, Big Bear Lake, Silverwood Lake, Lake Arrowhead, and Lake Gregory, along with associated waterways, serve as defining characteristics of the mountain regions within the County. San Bernardino County has a wide variety of scenic and wilderness areas respectively categorized as the Mountain, Valley, and Desert regions. Each region has its own defined measures for protecting the specific resources contained in this region. The County of San Bernardino also considers desert night-sky views to be scenic resources and has enacted measures to reflect this (San Bernardino County, ~~2007~~2012).

In addition to County plans, many of the cities within the district have general plan policies, and in some cases, ordinances, related to the protection of visual resources. In addition to the visual resources related to natural areas, many features of the built environment that may also have visual significance include individual or groups of structures that are distinctive due to their aesthetic, historical, social, or cultural significance or characteristics, such as architecturally appealing buildings or groups of buildings, landscaped freeways, bridges or overpasses, and historic resources.

3.1.3.3 Scenic Highways

Within the district, there are numerous officially designated state and county scenic highways and one historic parkway, as listed in Table 3.1-2.

There are also a number of roadways that have been determined eligible for state scenic highway designation, as listed in Table 3.1-3.

TABLE 3.1-2

Scenic Highways Within District Borders

Route	County	Location	Description	Miles	Designation
2	Los Angeles	From near La Cañada Flintridge north to the San Bernardino County line.	This U.S. Forest Service Scenic Byway and State Scenic Highway winds along the spine of the San Gabriel Mountains. It provides views of the mountain peaks, the Mojave Desert, and the Los Angeles Basin.	55	ODSSH[a]
38	San Bernardino	From east of South Fork Campground to State Lane.	This U.S. Forest Service Scenic Byway and State Scenic Highway crosses the San Bernardino Mountains at Onyx Summit. It features forested mountainsides with far-off desert vistas near the summit.	16	ODSSH
62	Riverside	From I-10 north to the San Bernardino County line.	This highway features high desert country scenery and leads to or from Joshua Tree National Monument. Large "windmill farms," where wind power is used to generate electricity, can be seen along the way.	9	ODSSH
74	Riverside	From west boundary of the San Bernardino National Forest to SR-111 in Palm Desert.	This road goes from the southern Mojave Desert to oak and pine forests of San Bernardino National Forest. It offers views of the San Jacinto Valley and peaks of the San Jacinto Mountains.	48	ODSSH
91	Orange	From SR-55 to east of Anaheim city limit.	This freeway runs along the banks of the Santa Ana River. Views include residential and commercial development with intermittent riparian and chaparral vegetation.	4	ODSSH

TABLE 3.1-2 (Continued)

Scenic Highways Within District Borders

Route	County	Location	Description	Miles	Designation
243	Riverside	From SR-74 to the Banning city limit.	This U.S. Forest Service Scenic Byway and State Scenic Highway traverses forested mountain scenery along a ridge of the San Bernardino Mountains. It then drops in a series of switchbacks offering views of the San Bernardino Valley and the desert scenery.	28	ODSSH
N/A	Los Angeles	Mulholland Highway from SR- 1 to Kanan Dume Road and from west of Cornell Road to east of Las Virgenes Road.	With the dramatic canyons, oak woodlands, open spaces and ocean views of the Santa Monica Mountains, Mulholland Highway offers travelers views of the mountains, the Pacific Ocean, and historic sites along its stretch.	19	ODCSH[(b)]
N/A	Los Angeles	Malibu Canyon- Las Virgenes Highway from State Route 1 to Lost Hills Road.	The rugged terrain and ancient rock formations along this route have been a backdrop of many early California settlers. The formations have known presence dating to the original De Anza expedition of Spanish colonists.	7.4	ODCSH

Source: Caltrans, Officially Designated State Scenic Highways, accessed July 2012.
(a) Officially Designated State Scenic Highway
(b) Officially Designated County Scenic Highway

TABLE 3.1-3

Highways Within District Boundaries Eligible for State Scenic Highway Designation

Route	County	Location (From/To)	Postmiles
1	Orange/LA	I-5 south of San Juan Capistrano/SR-19 near Long Beach	0.0-3.6
1	LA/(Ventura)	SR-187 near Santa Monica/SR-101 near El Rio	32.2-21.1
2	LA/SB	SR-210 in La Cañada Flintridge/SR 138 via Wrightwood	22.9-6.36
5	(SD)/Orange	Opposite Coronado/SR-74 near San Juan Capistrano	R14.0-9.6
5	LA	I-210 near Tunnel Station/SR-136 near Castaic	R44.0-R55.5
10	SB/Riverside	SR-38 near Redlands/SR-62 near Whitewater	T0.0-R10.0
15	(SD)/Riverside	SR-76 near San Luis Rey River/SR-91 near Corona	R46.5-41.5
15	SB	SR-58 near Barstow/SR-127 near Baker	76.9-R136.6
18	SB	SR-138 near Mt. Anderson/SR-247 near Lucerne Valley	R17.7-73.8
27	LA	SR-1/Mulholland Drive	0.0-11.1
30	SB	SR-330 near Highland/I-10 near Redlands	T29.5-33.3
38	SB	I-10 near Redlands/SR-18 near Fawnskin	0.0-49.5
39	LA	SR-210 near Azusa/SR-2	14.1-44.4
40	SB	Barstow/Needles	0.0-154.6
57	Orange/LA	SR-90/SR-60 near City of Industry	19.9-R4.5
58	(Kern)/SB	SR-14 near Mojave/I-15 near Barstow	112.0-R4.5
62	Riverside/SB	I-10 near Whitewater/Arizona State Line	0.0-142.7
71	Riverside	SR-91 near Corona/SR-83 north of Corona	0.0-G3.0
74	Orange/Riverside	I-5 near San Juan Capistrano/I-111 (All)	0.0-R96.0
79	(SD)/Riverside	SR-78 near Santa Ysabel/SR-371 near Aguanga	20.2-2.3
91	Orange/Riverside	SR-55 near Santa Ana Canyon/I-15 near Corona	R9.2-7.5
101	LA/(Ventura)/ (SBar)/(SLO)	SR-27 (Topanga Canyon Blvd)/SR-46 near Paso Robles	25.3-57.9
111	(Imperial)/ Riverside	Bombay Beach-Salton Sea/SR-195 near Mecca	57.6-18.4
111	Riverside	SR-74 near Palm Desert/I-10 near Whitewater	39.6-R63.4
118	(Ventura)/LA	SR-23/Desoto Avenue near Browns Canyon	17.4-R2.7
126	(Ventura)/LA	SR-150 near Santa Paula/I-5 near Castaic	R12.0-0R5.8
127	SB/(Inyo)	I-15 near Baker/Nevada State Line	L0.0-49.4
138	SB	SR-2 near Wrightwood/SR-18 near Mt. Anderson	6.6-R37.9
142	SB	Orange County Line/Peyton Dr.	0.0-4.4
173	SB	SR-138 near Silverwood Lake/SR-18 south of Lake Arrowhead	0.0-23.0
210	LA	I-5 near Tunnel Station/SR-134	R0.0-R25.0
215	Riverside	SR-74 near Romoland/SR-74 near Perris	23.5-26.3
243	Riverside	SR-74 near Mountain Center/I-10 near Banning	0.0-29.7
247	SB	SR-62 near Yucca Valley/I-15 near Barstow	0.0-78.1
330	SB	SR-30 near Highland/SR-18 near Running Springs	29.5-44.1

Source: Caltrans, Eligible and Officially Designated Routes, accessed July 2012.
LA = Los Angeles SB = San Bernardino SD = San Diego SBar = Santa Barbara SLO = San Luis Obispo
( ) = County not within the district

3.1.3.4 Coastal Zones

According to the California Coastal Act of 1976, a coastal zone is the land and water area of the State of California from the Oregon border to the border of Mexico, extending seaward to the state's outer limit of jurisdiction, including all offshore islands, and extending inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas, the coastal zone extends inland to the first major ridgeline paralleling the sea or five miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the coastal zone generally extends inland less than 1,000 yards.

The coastal zone within the district generally extends from Leo Carrillo State Park in Malibu in the northwestern corner of Los Angeles County to San Clemente Beach in San Clemente near the southern tip of Orange County.

Local Coastal Plans (LCPs) typically contain policies on visual access and site development review. LCPs are basic planning tools used by local governments to guide development in the coastal zone, in partnership with the California Coastal Commission. LCPs contain the ground rules for future development and protection of coastal resources in the 75 coastal cities and counties. The LCPs specify appropriate location, type, and scale of new or changed uses of land and water. Each LCP includes a land use plan and measures to implement the plan (such as zoning ordinances). Prepared by local government, these programs govern decisions that determine the short- and long-term conservation and use of coastal resources. While each LCP reflects unique characteristics of individual local coastal communities, regional and statewide interests and concerns must also be addressed in conformity with Coastal Act goals and policies.

SUBCHAPTER 3.2

AIR QUALITY

Criteria Air Pollutants

Non-Criteria Air Pollutants

3.2 AIR QUALITY

3.2.1 Criteria Air Pollutants

The purpose of the 2012 AQMP is designed to address the federal eight-hour and one-hour (revoked) ozone and PM2.5 air quality standards, to satisfy the planning requirements of the federal Clean Air Act (CAA), and to develop transportation emission budgets using the latest approved motor vehicle emissions model and planning assumptions. This chapter summarizes emissions that occurred in the Basin during the 2008 base year, and projected emissions in the years 2014, 2019, 2023, and 2030. More detailed emission data analyses are presented in Appendix III of the ~~Draft~~ 2012 AQMP. The 2008 base year emissions inventory reflects adopted air regulations with current compliance dates as of 2008; whereas future baseline emissions inventories are based on adopted air regulations with both current and future compliance dates. A list of the SCAQMD's and CARB's rules and regulations that are part of the base year and future-year baseline emissions inventories is presented in Appendix III of the ~~Draft~~ 2012 AQMP. The SCAQMD is committed to implement the SCAQMD rules that are incorporated in the ~~Draft~~ 2012 AQMP future baseline emissions inventories.

The emissions inventory is divided into four major classifications: point, area, on-road, and off-road sources. The 2008 base year point source emissions are based principally on reported data from facilities using the SCAQMD's Annual Emissions Reporting Program. The area source emissions are estimated jointly by CARB and the SCAQMD. The on-road emissions are calculated by applying CARB's EMFAC2011 emission factors to the transportation activity data provided by Southern California Association of Governments (SCAG) from their adopted 2012 Regional Transportation Plan (2012 RTP). CARB's 2011 In-Use Off-Road Fleet Inventory Model is used for the construction, mining, gardening and agricultural equipment. CARB also provides other off-road emissions, such as ocean-going vessels, commercial harbor craft, locomotives and cargo handling equipment. Aircraft emissions are based on an updated analysis by the SCAQMD. The future emission forecasts are primarily based on demographic and economic growth projections provided by SCAG. In addition, emission reductions resulting from SCAQMD regulations adopted by June, 2012 and CARB regulations adopted by August 2011 are included in the baseline.

This chapter summarizes the major components of developing the base year and future baseline inventories. More detailed information, such as CARB's and the SCAQMD's emission reductions resulting from adopted rules and regulations since the 2007 AQMP, growth factors, and demographic trends, are presented in Appendix III of the ~~Draft~~ 2012 AQMP. In addition, the top ten source categories contributing to the 2008, 2014, and 2023 emission inventories are identified in this chapter. Understanding information about the highest emitting source categories leads to the identification of potentially more effective and/or cost effective control strategies for improving air quality.

3.2.1.1 Current Emission Inventories

Two inventories are prepared for the ~~Draft~~ 2012 AQMP for the purpose of regulatory and SIP performance tracking and transportation conformity: an annual average inventory, and a summer planning inventory. Baseline emissions data presented in this chapter are based on average annual day emissions (e.g., total annual emissions divided by 365 days) and seasonally adjusted summer planning inventory emissions. The ~~Draft~~ 2012 AQMP uses annual average day emissions to estimate the cost-effectiveness of control measures, to rank control measure implementation, and to perform PM2.5 modeling and analysis. The summer planning inventory emissions are developed to capture the emission levels during a poor ozone air quality season, and are used to report emission reduction progress as required by the federal and California CAAs.

Detailed information regarding the emissions inventory development for the base year and future years, the emissions by major source category of the base year, and future baseline emission inventories are presented in Appendix III of the ~~Draft~~ 2012 AQMP. Attachments A and B to Appendix III list the annual average and summer planning emissions by major source category for 2008, 2014, 2017, 2019, 2023 and 2030, respectively. Attachment C to Appendix III of the ~~Draft~~ 2012 AQMP has the top VOC and NOx point sources which emitted greater than or equal to ten tons per year in 2008. Attachment D to the Appendix III of the ~~Draft~~ 2012 AQMP contains the on-road emissions by vehicle class and by pollutant for 2008, 2014, 2019, 2023 and 2030. Attachment E to Appendix III of the ~~Draft~~ 2012 AQMP shows emissions associated with the combustion of diesel fuel for various source categories.

3.2.1.1.1 Stationary Sources

Stationary sources can be divided into two major subcategories: point and area sources. Point sources are large emitters with one or more emission sources at a permitted facility with an identified location (e.g., power plants, refineries). These facilities have annual emissions of four tons or more of either VOC, NOx, SOx, PM, or annual emissions of over 100 tons of CO or toxic air contaminants (TACs). Facility owners/operators are required to report their criteria pollutant emissions and selected TACs to the SCAQMD on an annual basis, if any of these thresholds are exceeded.

Area sources consist of many small emission sources (e.g., residential water heaters, architectural coatings, consumer products, as well as, permitted sources smaller than the above thresholds), which are distributed across the region. There are about 400 area source categories for which emissions are jointly developed by CARB and the SCAQMD. The emissions from these sources are estimated using activity information and emission factors. Activity data are usually obtained from survey data or scientific reports (e.g., Energy Information Administration (EIA) reports for fuel consumption other than natural gas fuel, Southern California Gas Company for natural gas consumption, paint suppliers, and SCAQMD databases). The emission factors are based on rule compliance factors, source tests, Material Safety Data Sheets (MSDS), default factors (mostly from AP-42, U.S. EPA's published emission factor compilation), or weighted emission factors derived from the point sources in annual emissions reports. Socioeconomic data may also be used to estimate emissions over specific areas.

Appendix III of the ~~Draft~~ 2012 AQMP has more detail regarding emissions from specific source categories such as fuel combustion sources, landfills, composting waste, metal-coating operations, architectural coatings, and livestock waste. Since the 2007 AQMP was finalized, new area source categories, such as liquefied petroleum gas (LPG) transmission losses, storage tank and pipeline cleaning and degassing, and architectural colorants were characterized and included in the emission inventories. These updates and new additions are listed below:

- Fuel combustion sources: The emissions inventories from commercial and industrial internal combustion engines were updated to include the portable equipment emissions.
- Landfills: The emission inventories for this area source category was revised to incorporate CARB's landfills greenhouse gas (GHG) emissions.
- Composting waste operations: The emission inventories for this area source category were revised to include the emissions from green waste composting covered under SCAQMD Rule 1133.3. The 2007 AQMP only included the emissions from co-composting, as it relates to SCAQMD Rule 1133.2.
- Metal coating operations: The area source emissions inventory in the 2007 AQMP only included the emissions from small permitted facilities with VOC emissions below four tons per year. As such, emissions from these sources have been underreported in the 2007 AQMP. During the rule development process amending Rule 1107, SCAQMD staff discovered numerous small shops using coating materials with compliant high-solid content, which were subsequently thinned beyond the allowable limits allowed by Rule 1107. The ~~Draft~~ 2012 AQMP revised emission inventory adjusts the 2007 AQMP emission inventory to account for excess emissions from these coating activities.
- Architectural coating category: Three new area source categories were added to the emissions inventory under this category to track the emissions from colorants.
- LPG transmission losses: This newly added area source category was developed to quantify the emissions from LPG storage and fueling losses.
- Livestock waste sources: This emission inventory category was updated to reflect the difference in types of dairy cattle milking cows, dry cows, calves, and heifers as each type of cattle has specific VOC and NH3 emission factors based on the quantity of manure production.
- Storage tanks and pipeline cleaning: This new area source emissions category was added to quantify the emissions from these types of operations.

3.2.1.1.2 Mobile Sources

Mobile sources consist of two subcategories: on-road and off-road sources. On-road sources are from vehicles that are licensed to drive on public roads. Off-road sources are typically registered with the state and cannot be typically driven on public roads. On-road vehicle emissions are calculated by applying CARB's EMFAC2011 emissions factors to the transportation activity data provided by SCAG in their adopted 2012 RTP. Spatial distribution data from Caltrans' Direct Travel Impact Model (DTIM4) are used to generate gridded emissions for regional air quality modeling. Off-road emissions are calculated using CARB's 2011 In-Use Off-Road Emissions Inventory model for construction, mining, gardening, and agricultural equipment. Ship, locomotive, and aircraft emissions are excluded from CARB's In-Use Off-Road Emissions Inventory model. The emissions for 2008 and future years were revised separately based on the most recently available data.

3.2.1.1.3 On-Road

CARB's EMFAC2011 has been updated to reflect more recent vehicle population, activity, and emissions data. Light-duty motor vehicle fleet age, vehicle type, and vehicle population are updated based on 2009 California Department of Motor Vehicles data. The model also reflects recently adopted rules and benefits that were not reflected in EMFAC2007. The rules and benefits include on-road diesel fleet rules, the Pavley Clean Car Standards, and the Low Carbon Fuel standard. The most important improvement in the model is the integration of new data and methods to estimate emissions from diesel trucks and buses. CARB's Truck and Bus Regulation for the on-road heavy-duty in-use diesel vehicles applies to nearly all privately owned diesel fueled trucks and privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. EMFAC2011 includes the emissions benefits of the Truck and Bus Rule and previously adopted rules for other on-road diesel equipment. The impacts of the recent recession on emissions, quantified as part of the truck and bus rulemaking, are also included.

EMFAC2011 uses a modular emissions modeling approach that departs from past EMFAC versions. The first module, named EMFAC-LDV, is used as the basis for estimating emissions from gasoline powered on-road vehicles, diesel vehicles below 14,000 pounds GVWR, and urban transit buses. The second module, called EMFAC-HD, is the basis for emissions estimates for diesel trucks and buses with a GVWR greater than 14,000 pounds operating in California. This module is based on the Statewide Truck and Bus Rule emissions inventory that was developed between 2007 and 2010 and approved by ~~the~~ CARB ~~Board~~ in December 2010. The third module is called EMFAC2011SG. It takes the output from EMFAC-LDV and EMFAC-HD and applies scaling factors to estimate emissions consistent with user-defined vehicle miles of travel and vehicle speeds. Together the three modules comprise EMFAC2011.

Several external adjustments were made to EMFAC2011 in the ~~Draft~~ 2012 AQMP to reflect CARB's rules and regulations, which were adopted after the development of EMFAC2011. The adjustments include the advanced clean cars regulations, reformulated gasoline, and smog check improvement.

Figure 3.2-1 compares the on-road emissions between EMFAC2007 V2.3 used in the 2007 AQMP and EMFAC2011 used in the ~~Draft~~ 2012 AQMP, respectively. It should be noted that the comparison for 2008 reflects changes in methodology; whereas, the comparison for 2023 includes adopted rules and updated growth projections since the release of EMFAC2007. In general, the emissions are lower in EMFAC2011 as compared to EMFAC2007. The lower emissions can be attributed to additional rules and regulations, which result in reduced emissions, revisions to growth projections, and the economic impacts of the recent recession.

3.2.1.1.4 Off-Road

Emissions from off-road vehicle categories (construction & mining equipment, lawn & gardening equipment, ground support equipment, agricultural equipment) in CARB's In-Use Off-Road Emissions Inventory Model were developed primarily based on estimated activity levels and emission factors. Ships, commercial harbor craft, locomotives, aircraft, and cargo handling equipment emissions are not included in CARB's In-Use Off-Road Emissions Inventory Model. Separate models or estimations were used for these emissions sources. The off-road source population, activities, and emission factors were re-evaluated and re-estimated since the 2007 AQMP. Consequently, the emissions are modified accordingly.

The major updates and/or improvements to the off-road inventory include:

1. The equipment population in CARB's In-Use Off-Road Emissions Inventory model was updated by using the equipment population reported to CARB for rule compliance. Based on information from CARB, the total population in 2009 was 26 percent lower than had been anticipated in 2007 due to fleet downsizing during the recent recession.

2. The equipment hours of use in CARB's In-Use Off-Road Emissions Inventory model were updated with reported activity data for the period between 2007 and 2009. According to CARB staff, the new data indicates a 30 percent or greater reduction in most cases in 2009 activity data when compared to 2007 activity data due to the recession.

3. The equipment load factor in CARB's In-Use Off-Road Emissions Inventory model was updated using a 2009 academic study and information from engine manufacturers. According to CARB, the new data suggests that the load factors should be reduced by about 33 percent.

4. According to CARB staff, construction activity and emissions have dropped by more than 50 percent between 2005 and 2011. Emissions beyond 2011 are uncertain and depend on the pace of economic recovery. The future growth in CARB's In-Use Off-Road Emissions Inventory model was projected based on the average of the future forecast scenarios. CARB's data suggest off-road activity and emissions will recover slowly from the recessionary lows.

5. Locomotive inventories reflect the 2008 U.S. EPA Locomotive regulations and adjustments due to economic activity.

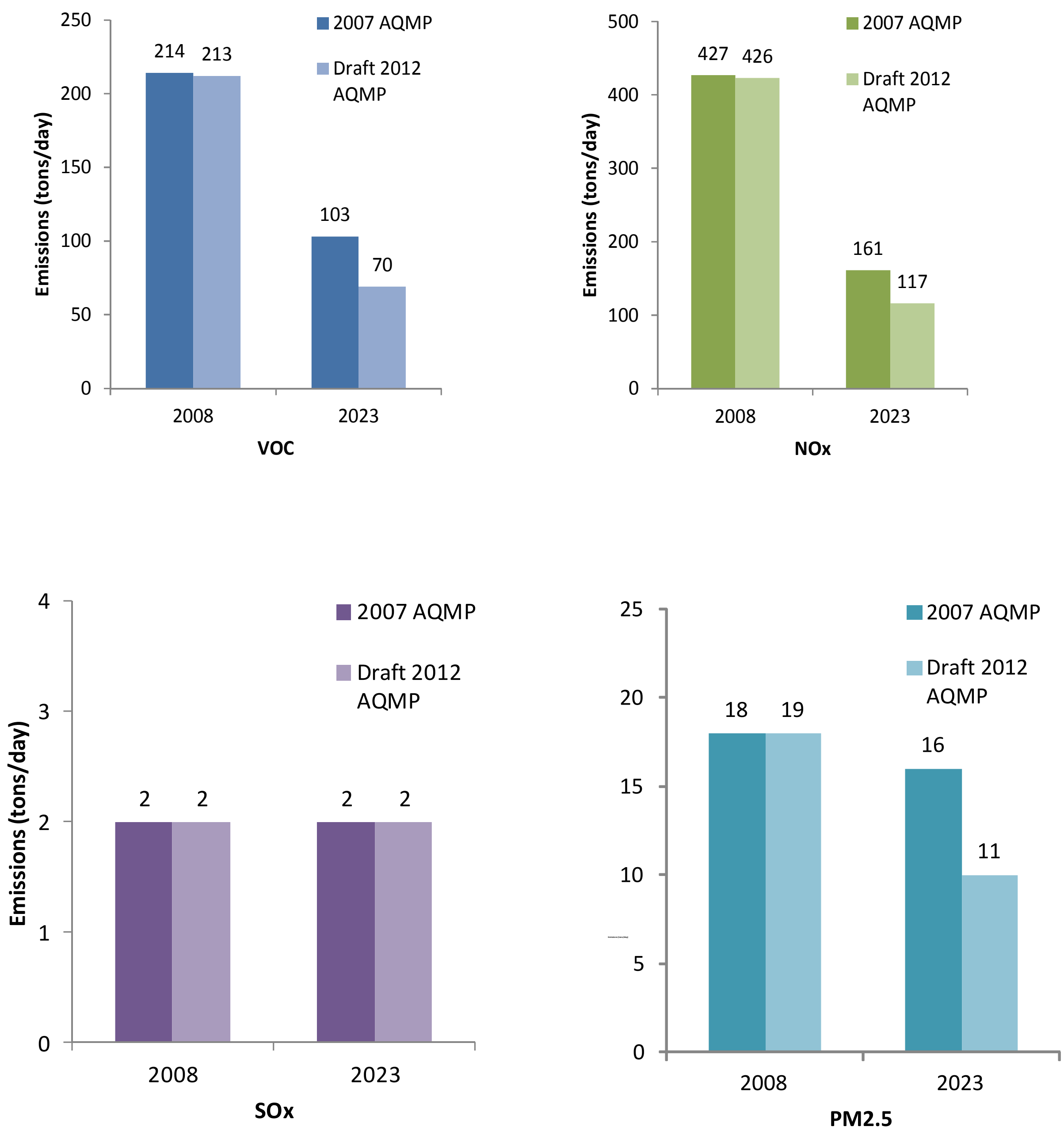

FIGURE 3.2-1

Comparison of On-Road Emissions Between EMFAC2007 V2.3 (2007 AQMP) and EMFAC2011 (~~Draft~~ 2012 AQMP)
(VOC & NOx – Summer Planning; SOx & PM2.5 – Annual Average Inventory)

6. Cargo handling equipment was updated with population, activity, engine load, and recessionary impacts on growth. The updates are based on new information collected since 2005. The new information includes CARB's regulatory reporting data, which includes all the cargo handling equipment in the state including their model year, horsepower and activity. In addition, the Ports of Los Angeles and Long Beach have developed annual emissions inventories, and a number of the major rail yards and other ports in the state have completed individual emission inventories.

7. Ocean-going vessel emissions in the ~~Draft~~ 2012 AQMP included CARB's fuel regulation for ocean-going vessels and the 2007 shore power regulation. The improvements and corrections include recoding the model for speed, updating auxiliary engine information, updating ship routing, revising vessel speed reduction compliance rates, and an adjustment factor to estimate the effects of the recession. In March 2010, the International Maritime Organization (IMO) officially designated the waters within 200 miles of the North American Coast as an Emissions Control Area (ECA). Beginning August 2012, IMO requires ships that travel these waters use fuel with a sulfur content of less than or equal to 1.0 percent, and in 2015 the sulfur limit will be further reduced to 0.1 percent. Additionally, vessels built after January 1, 2016, will be required to meet the most stringent IMO Tier 3 NOx emission levels, while transiting within the 200 mile ECA zone. Outer Continental Shelf (OCS) emissions (e.g., emissions from vessels beyond the three-mile state waters line) are included in the ships emissions as well.

8. Another improvement was the development of a separate emission category for commercial harbor craft using a new commercial harbor craft database. CARB approved a regulation to significantly reduce diesel PM and NOx emissions from diesel-fueled engines on commercial harbor craft vessels. These vessels emit an estimated three tons per day of diesel PM and 70 tons per day of NOx statewide in 2007. The harbor craft database includes emissions from crew and supply, excursion, fishing, pilot, tow boats, barge, and dredge vessels.

9. The aircraft emissions inventory was updated for the 2008 base year and the 2035 forecast year based on the latest available activity data and calculation methodologies. A total of 43 airports were identified as having aircraft operations within the SCAQMD boundaries including commercial air carrier, air taxi, general aviation, and military aircraft operations. The sources of activity data include airport operators (for several commercial and military airports), FAA's databases (e.g., Bureau of Transportation Statistics, Air Traffic Activity Data System, and Terminal Area Forecast), and SCAG. For commercial air carrier operations, SCAG's 2035 forecast, which is consistent with the forecast adopted for the 2012 RTP, reflects the future aircraft fleet mix. The emissions calculation methodology was primarily based on the application of FAA's Emissions and Dispersion Modeling System (EDMS) model for airports with detailed activity data for commercial air carrier operations (by aircraft make and model). For other airports and aircraft types (e.g., general aviation, air taxi, military), the total number of landing and takeoff activity data was used in conjunction with the U.S. EPA's average emission factors for major aircraft types (e.g., general aviation, air taxi,

military). For the intermediate milestone years, the emissions inventories were linearly interpolated between 2008 and 2035.

Several external adjustments to the off-road emissions were made to reflect CARB's rules and regulations and new estimates of activity. The adjustments include locomotives, large spark ignition engines and non-agricultural internal combustion engines. Figure 3.2-2 shows a comparison between the off-road baseline emissions in the 2007 AQMP and the ~~Draft~~ 2012 AQMP. In general, the emissions are lower in the 2011 In-Use Off-Road Emissions Inventory model, except for 2008 SOx emissions. The projected 2008 off-road NOx emissions in the 2007 AQMP were 339 tons per day, while the 2008 base year off-road NOx emissions in the ~~Draft~~ 2012 AQMP are 209 tons per day. The 2011 In-Use Off-Road Emissions Inventory generated lower emissions because of rules and regulations adopted since 2007 OFFROAD model, updated data, future growth corrections and recessionary impacts to commercial and industrial mobile equipment. The higher 2008 estimated SOx emissions reflect a temporary stay in the implementation of the lower sulfur content marine fuel regulation that occurred during a portion of 2008.

3.2.1.1.5 Uncertainty in the Inventory

An effective AQMP relies on a complete and accurate emission inventory. Over the years, significant improvements have been made in emission estimates for sources affected by control measures. Increased use of continuous monitoring and source tests has contributed to the improvement in point source inventories. Technical assistance to facilities and auditing of reported emissions by SCAQMD staff have also improved the accuracy of the emissions inventory. Area source inventories that rely on average emission factors and regional activities have inherent uncertainty. Industry-specific surveys and source-specific studies during rule development have provided much needed refinement to the emissions estimates.

Mobile source inventories remain the greatest challenge due to new information continuously collected from the large number and types of equipment and engines. Every AQMP revision provides an opportunity to further improve the current knowledge of mobile source inventories. The ~~Draft~~ 2012 AQMP is not an exception. As described earlier, many improvements were included in EMFAC2011, and such work is ongoing. However, it should be acknowledged that there are still areas that could be significantly improved if better data were available. Technological changes and advancement in the area of electric, hybrid, flexible fuel, fuel cell vehicles coupled with changes in future gasoline prices all add uncertainty to the on-road emissions inventory.

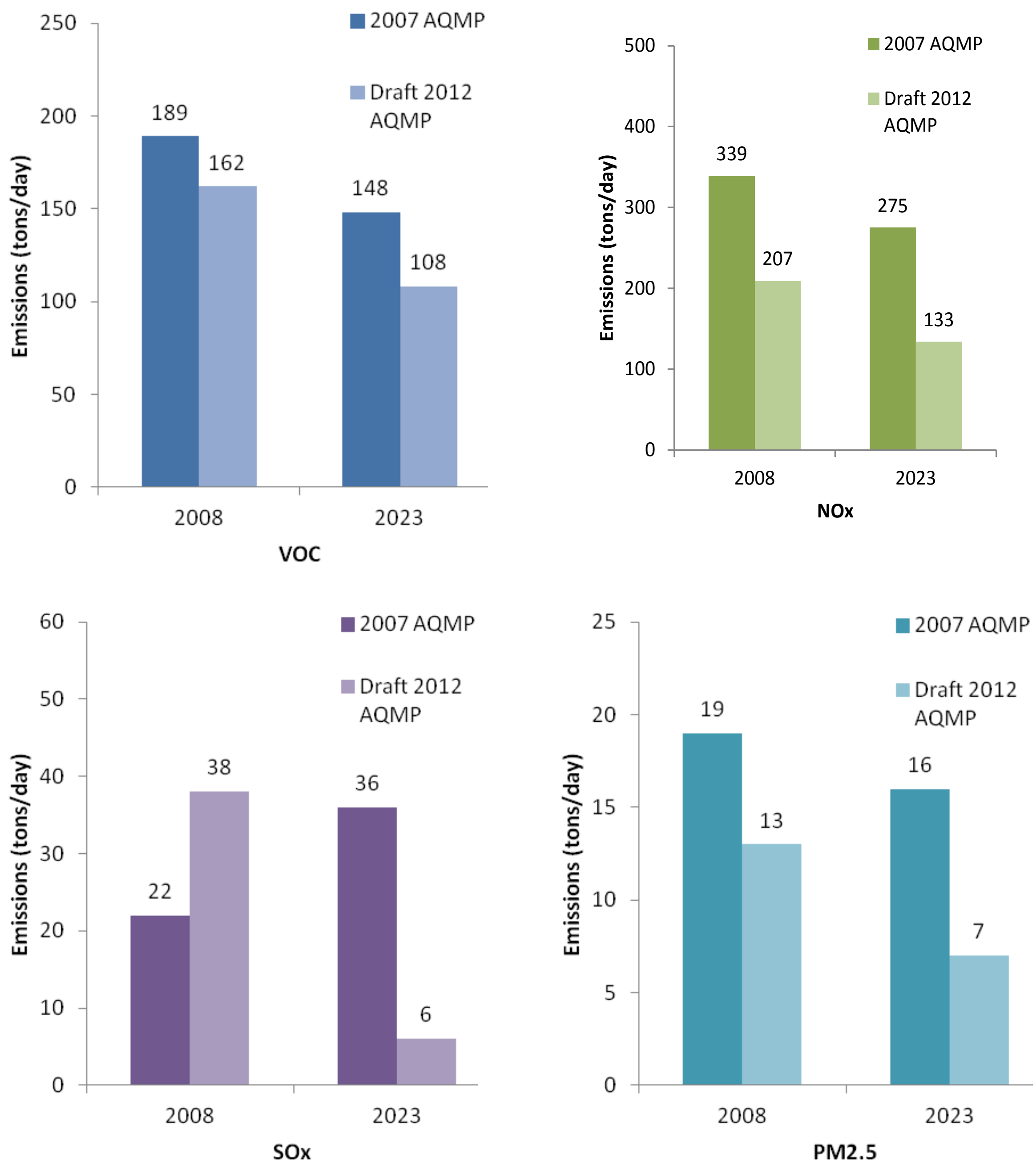

FIGURE 3.2-2

Comparison of Off-Road Emissions Between 2007 AQMP and ~~Draft~~ 2012 AQMP
(VOC & NOx – Summer Planning; SOx & PM2.5 – Annual Average Inventory)

It is important to note that the recent recession began in 2007, and since it was unforeseen at the time, associated impacts were not included in the 2007 AQMP. As the ~~Draft~~ 2012 AQMP is developed, Southern California is in a slow economic recovery. The impact of the recession is deep and is still being felt and, thus, adds to the uncertainty in the emission estimates provided in this analysis. There are many challenges with making accurate projections of future growth, such as, where vehicle trips will occur, the distribution between various modes of transportation (such as trucks and trains), as well as, estimates for population growth and changes to the numbers and types of jobs held. Forecasts are made with the best information available; nevertheless, these issues contribute to the overall uncertainty in emissions projections. Fortunately, AQMP updates are generally developed every three to four years; thereby allowing for frequent improvements to the emission inventories.

3.2.1.1.6 *Gridded Emissions*

The air quality modeling region for the 2012 AQMP extends to Southern Kern County in the north, the Arizona border in the east, northern Mexico in the south and more than 100 miles offshore to the west. The modeling area is divided into a grid system comprised of four kilometer square grid cells defined by Lambert Conformal coordinates. Both stationary and mobile source emissions are allocated to individual grid cells within the modeled area. In general, daily modeling emissions are used. Variations in temperature, hours of operation, speed of motor vehicles, and/or other factors are considered in developing gridded motor vehicle emissions. The gridded emissions data used for both PM2.5 and ozone modeling applications differ from the average annual day or planning inventory emission data in two respects: (1) the air quality modeling region covers larger geographic areas than the Basin; and (2) emissions used in air quality modeling represent day-specific instead of average or seasonal conditions. For PM2.5, the annual average day is use d in the air quality modeling, which represents the characteristic of emissions that contribute to year-round particulate impacts. The summer planning inventory, which is used for ozone modeling analyses, focuses on the warmer months (May through October) when evaporative VOC emissions play an important role in ozone formation.

3.2.1.2 Base Year Emissions - 2008 Emission Inventory

Table 3.2-1A compares the annual average emissions between the 2008 base year in the ~~Draft~~ 2012 AQMP and the projected 2008 emissions in the 2007 AQMP by major source category for VOC and NOx. Table 3.2-1B compares the annual average emissions between the 2008 base year in the ~~Draft~~ 2012 AQMP and the projected 2008 emissions in the 2007 AQMP for SOx and PM2.5. Due to the economic recession which began in 2007, it is expected that the more recent 2008 base year emissions estimates should be lower than the previously projected 2008 emissions. Yet, several categories show higher emissions in the 2008 base year in the ~~Draft~~ 2012 AQMP, such as fuel consumption, waste disposal, petroleum production and marketing for VOC; fuel consumption for NOx; off-road emissions for SOx; and industrial processes for PM2.5. The reasons for these differences are as follows:

1. Fuel consumption – The emissions from commercial and industrial internal combustion engines were updated to include portable equipment emissions, which were overlooked in the 2007 AQMP. The update causes increases in emissions for this category.

2. Waste disposal – Due to erroneous activity data reported by point sources in the 2007 AQMP, landfill emissions were revised substantially upward in the corrected emissions inventory used for the 2012 AQMP. In addition, landfill emission estimation methodology was revised to incorporate CARB's GHG Emission Inventory data, which includes the amount of methane being generated in 2008. Industry stakeholders have requested further evaluation of these emission factors used. As a result, the SCAQMD staff will initiate a working group to undertake this effort.

3. Petroleum production and marketing – Two new area source categories (LPG transmission, storage tanks and pipeline cleaning and degassing) were added to the ~~Draft~~ 2012 AQMP. LPG transmission sources were added based on data from the development of Rule 1177. LPG transmission source category includes the fugitive emissions associated with transfer and dispensing of LPG and is based on emission rates derived from the SCAQMD source tests conducted in 2008 and 2011, sale volumes provided by the industry association, and category breakdowns. A total of 8.4 tons per day VOC emissions were added to the 2008 emissions inventory. The storage tanks and pipeline cleaning and degassing source category was updated based on Rule 1149 amendments to reflect more frequent degassing events, as well as, the effectiveness of control techniques. During the amendment to the rule, it was determined that the actual number of degassing events were more than triple the number that was estimated when the rule was originally developed. It was also originally assumed that once the degassing rule requirements were fulfilled, there would be no more fugitive emissions; however, a review of degassing logs indicated that sludge and product residual in the storage tanks continued to generate fugitive emissions, which significantly increase the emissions from the storage tanks. Finally, the source category was expanded to include previously exempted tanks and pipelines. The storage tanks and pipeline source adds 1.4 tons per day VOC to the 2008 base year.

4. Off-road SOx – CARB adopted a regulation in 2005 to set sulfur content limits on marine fuels for auxiliary diesel engines and diesel-electric engines operated on ocean-going vessels within California waters and 24 nautical miles of the California coastline. The regulation became effective January 1, 2007, and as a result the SOx reductions were accounted for in the 2007 AQMP. However, pursuant to an injunction issued by a federal district court (district court), CARB ceased enforcing the regulation in the fall of 2007. See *Pacific Merchant Shipping Ass'n v. Thomas A. Cackette* (E.D. Cal. Aug. 30, 2007), No. Civ. S-06 2791-WBS-KJM. CARB filed an appeal with the Ninth Circuit and requested a stay of the injunction pending the appeal. As permitted under the appellate court stay, CARB decided to continue to enforce the regulation while litigation involving the regulation remained active. On May 7, 2008, CARB issued another announcement to discontinue enforcement of the regulation pursuant to the same injunction after the Court of Appeals issued its decisions which invalidated the 2005 regulation. In the meantime, CARB staff prepared a new Ocean-Going Vessel Clean Fuel Regulation that was approved by its Board on July 24, 2008, and implementation began on July 1, 2009. The 2008 regulation includes the auxiliary engines and also the main engines and auxiliary boilers on ocean-going vessels within the same 24 nautical miles zone as the earlier auxiliary engine rule. The 2008

regulation achieves higher SOx reductions than the original auxiliary engine rule, primarily due to regulating the main engines and auxiliary boilers in addition to the auxiliary engines.

Tables 3.2-1A and 3.2-1B show the 2008 emissions inventory by major source category. Table 3.2-2A shows annual average emissions, while 3.2-2B shows the summer planning inventory. Stationary sources are subdivided into point (e.g., chemical manufacturing, petroleum production, and electric utilities) and area sources (e.g., architectural coatings, residential water heaters, consumer products, and permitted sources smaller than the emission reporting threshold – generally four tons per year). Mobile sources consist of on-road (e.g., light-duty passenger cars) and off-road sources (e.g., trains and ships). Entrained road dust emissions are also included.

Figure 3.2-3 characterizes relative contributions by stationary and mobile source categories. On- and off-road sources continue to be the major contributors for each of the five criteria pollutants. Overall, total mobile source emissions account for 59 percent of the VOC and 88 percent of the NOx emissions for these two ozone-forming pollutants, based on the summer planning inventory. The on-road mobile category alone contributes about 33 and 59 percent of the VOC and NOx emissions, respectively, and approximately 27 percent of the CO for the annual average inventory. For directly emitted PM2.5, mobile sources represent 23 percent of the emissions with another 10 percent due to vehicle-related entrained road dust.

Within the category of stationary sources, point sources contribute more SOx emissions than area sources. Area sources play a major role in VOC emissions, emitting about seven times more than point sources. Area sources, including sources such as commercial cooking, are the predominant source of directly emitted PM2.5 emissions (39 percent).

3.2.1.3 Future Emissions

3.2.1.3.1 Data Development

The milestone years 2008, 2014, 2019, 2023, and 2030 are the years for which emission inventories were developed as they are relevant target years under the federal CAA and the California CAA. The base year for the 24-hour PM2.5 attainment demonstration is 2008. The attainment year for the federal 2006 24-hour PM2.5 standard without an extension is 2014 and 2019 represents the latest attainment date with a full five-year extension. The 80 ppb federal 8-hour ozone standard attainment deadline is 2023, and the new 75 ppb 8-hour ozone standard deadline is 2032. A 2030 inventory will be used to approximate this latter year.

TABLE 3.2-1A

Comparison of VOC and NOx Emissions By Major Source Category of
2008 Base Year in ~~Revised Draft~~ 2012 AQMP and Projected 2008 in 2007 AQMP
Annual Average Inventory (tpd[a])

SOURCE CATEGORY	2007 AQMP	~~Draft~~ 2012 AQMP	Percent Change	2007 AQMP	~~Draft~~ 2012 AQMP	Percent Change
	VOC			NOx		
STATIONARY SOURCES						
Fuel Combustion	7	14	~~97~~100%	30	~~41~~ 40	36%
Waste Disposal	8	12	50~~1~~%	2	2	~~-24~~0%
Cleaning and Surface Coatings	37	37	0%	0	0	0%
Petroleum Production and Marketing	32	41	28%	0	0	0%
Industrial Processes	19	16	-16~~7~~%	0	0	0%
SOLVENT EVAPORATION						
Consumer Products	97	98	1%	0	0	0%
Architectural Coatings	23	22	-5%	0	0	0%
Others	3	2	-33~~2~~%	0	0	0%
Misc. Processes	15	15~~6~~	40%	26	26	0%
RECLAIM Sources	0	-0%-	0%-	29	23	-21~~0~~%
Total Stationary Sources	**241**	**257**	**7%**	**87**	**92**	**6%**
MOBILE SOURCES						
On-Road Vehicles	207	209	1%	447	462	3%
Off-Road Vehicles	150	127	-15%	325	204	-37%
Total Mobile Sources	**357**	**336**	**-6%**	**772**	**666**	**-14%**
TOTAL	**598**	**593**	**-1%**	**859**	**758~~7~~**	**-124%**

[a] Values are rounded to nearest integer.

TABLE 3.2-1B

Comparison of SOx and PM2.5 Emissions By Major Source Category of 2008 Base Year in ~~Revised Draft~~ 2012 AQMP and Projected 2008 in 2007 AQMP
Annual Average (tpd[a])

SOURCE CATEGORY	2007 AQMP	~~Draft~~ 2012 AQMP	Percent Change	2007 AQMP	~~Draft~~ 2012 AQMP	Percent Change
	SOx			PM2.5		
STATIONARY SOURCES						
Fuel Combustion	2	2	~~-3~~0%	6	6	~~-3~~0%
Waste Disposal	0	0	0%	0	0	0%
Cleaning and Surface Coatings	0	0	0%	1	1~~2~~	~~53~~0%
Petroleum Production and Marketing	1	1	~~-32~~0%	1	2	100~~68~~%
Industrial Processes	0	0	0%	5	7	40~~37~~%
Solvent Evaporation						
Consumer Products	0	0	0%	0	0	0%
Architectural Coatings	0	0	0%	0	0	0%
Others	0	0	0%	0	0	0%
Misc. Processes	1	1	~~-46~~0%	52	32	-39%
RECLAIM Sources	12	10	-17~~5~~%	0	0	0%
Total Stationary Sources	16	14	-12~~4~~%	65	48	-26%
MOBILE SOURCES						
On-Road Vehicles	2	2	~~5~~0%	18	19	~~3~~6%
Off-Road Vehicles	14	38	171~~0~~%	18	13	-28~~5~~%
Total Mobile Sources	16	40	150~~3~~%	36	32	-11%
TOTAL	32	54	~~70~~64%	101	80	-21%

[a] Values are rounded to nearest integer.
[b] Refer to Base Year Emissions – Off-road-SOx.

TABLE 3.2-2A

Summary of Emissions By Major Source Category: 2008 Base Year
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
STATIONARY SOURCES					
Fuel Combustion	14	41	57	2	6
Waste Disposal	12	2	1	0	0
Cleaning and Surface Coatings	37	0	0	0	2
Petroleum Production and Marketing	41	0	5	1	2
Industrial Processes	16	0	2	0	7
Solvent Evaporation					
Consumer Products	98	0	0	0	0
Architectural Coatings	22	0	0	0	0
Others	2	0	0	0	0
Misc. Processes	15~~6~~	26	72	1	32
RECLAIM Sources	0	23	0	10	0
Total Stationary Sources	257	92	137	14	~~41~~ 48
MOBILE SOURCES					
On-Road Vehicles	209	462	1,966	2	19
Off-Road Vehicles	127	204	778	38	13
Total Mobile Sources	336	666	2,744	40	32
TOTAL	593	758~~7~~	2,881	54	~~73~~ 80

[a] Values are rounded to nearest integer.

TABLE 3.2-2B

Summary of Emissions By Major Source Category: 2008 Base Year Summer Planning Inventory (tpd[a])

SOURCE CATEGORY	SUMMER OZONE PRECURSORS	
	VOC	NOx
STATIONARY SOURCES		
Fuel Combustion	14	~~42~~ 41
Waste Disposal	12	2
Cleaning and Surface Coatings	43	0
Petroleum Production and Marketing	41	0
Industrial Processes	19	0
Solvent Evaporation		
Consumer Products	100	0
Architectural Coatings	25	0
Others	2	0
Misc. Processes	9	19
RECLAIM Sources		24
Total Stationary Sources	**264**	**87**
MOBILE SOURCES		
On-Road Vehicles	213	426
Off-Road Vehicles	163	208
Total Mobile Sources	**376**	**634**
TOTAL	**~~640~~ 639**	**721**

[a] Values are rounded to nearest integer.

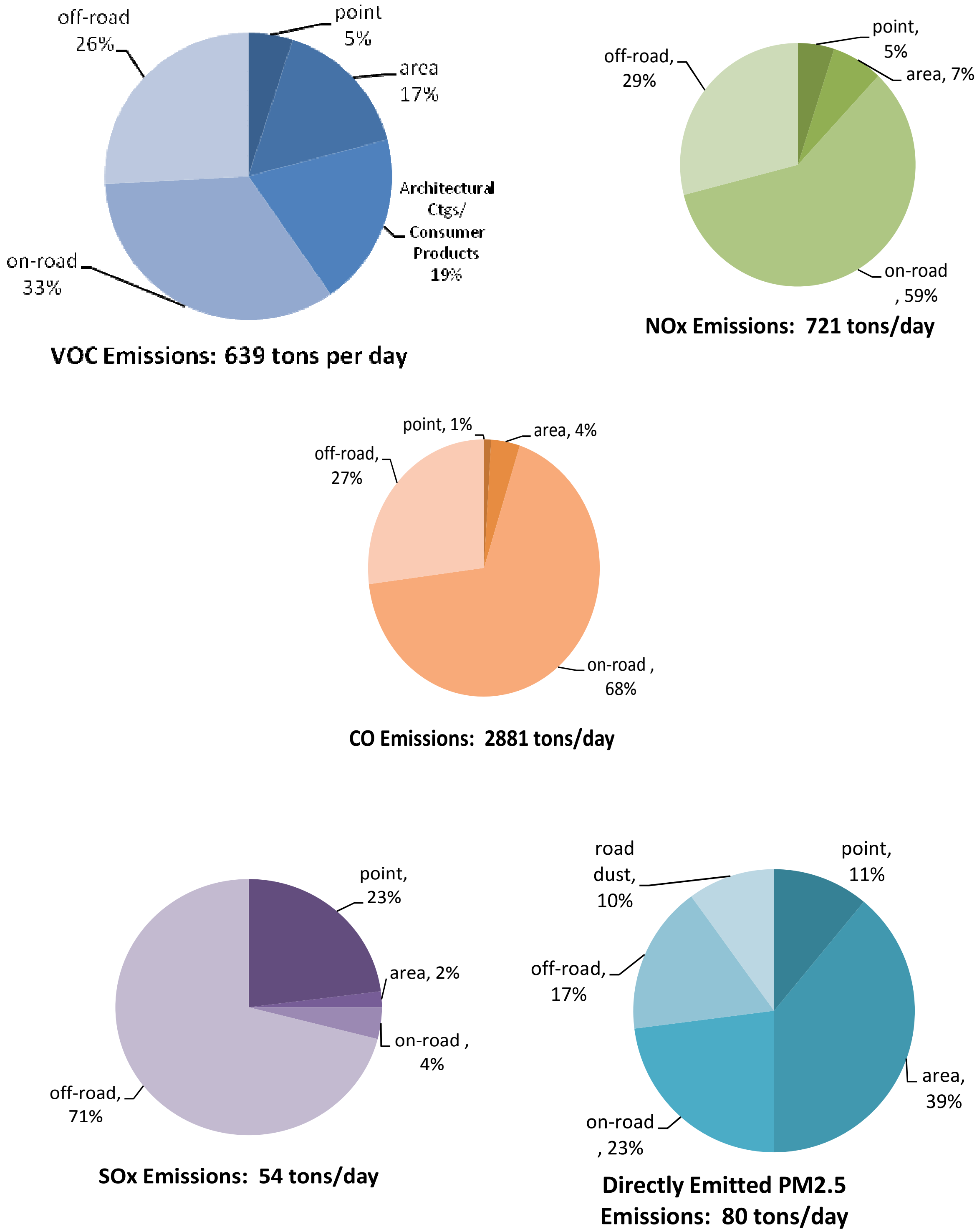

FIGURE 3.2-3
Relative Contribution by Source Category to 2008 Emission Inventory
(VOC & NOx – Summer Planning; CO, SOx, & PM2.5 – Annual Average Inventory)

Future stationary emission inventories are divided into RECLAIM and non-RECLAIM emissions. Future NOx and SOx emissions from RECLAIM sources are estimated based on their allocations as specified by SCAQMD Rule 2002 –Allocations for NOx and SOx. The forecasts for non-RECLAIM emissions were derived using: (1) emissions from the 2008 base year; (2) expected controls after implementation of SCAQMD rules adopted by June, 2012, and CARB rules adopted as of August 2011; and (3) activity growth in various source categories between the base and future years.

Demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) developed by SCAG for their 2012 RTP are used in the ~~Draft~~ 2012 AQMP. Industry growth factors for 2008, 2014, 2018, 2020, 2023, and 2030 are also provided by SCAG, and interim years are calculated by linear interpolation. Table 3.2-3 summarizes key socioeconomic parameters used in the ~~Draft~~ 2012 AQMP for emissions inventory development.

TABLE 3.2-3

Baseline Demographic Forecasts in the ~~Draft~~ 2012 AQMP

CATEGORY	2008	2023	2023 % GROWTH FROM 2008	2030	2030 % GROWTH FROM 2008
Population (Millions)	15.6	17.3	11%	18.1	16%
Housing Units (Millions)	5.1	5.7	12%	6.0	18%
Total Employment (Millions)	7.0	7.7	10%	8.1	16%
Daily VMT (Millions)	379	396	4%	421	11%

Current forecasts indicate that this region will experience a population growth of 11 percent between 2008 and 2023, with a four percent increase in vehicle miles traveled (VMT); and a population growth of 16 percent by the year 2030 with a 11 percent increase in VMT.

As compared to the projections in the 2007 AQMP, the current 2030 projections in the ~~Draft~~ 2012 AQMP show about 1.5 million less population (7.6 percent less), 900,000 less total employment (10 percent less), and 32 million miles less in the daily VMT forecast (7.1 percent less).

3.2.1.3.2 Summary of Future Baseline Emissions

Emissions data by source categories (point, area, on-road mobile and off-road mobile sources) and by pollutants are presented in Tables 3.2-4 through 3.2-7 for the years 2014, 2019, 2023, and 2030. The tables provide annual average, as well as, summer planning inventories.

Without any additional controls, VOC, NOx, and SOx emissions are expected to decrease due to existing regulations, such as controls on off-road equipment, new vehicle standards, and the RECLAIM programs. Figure 3.2-4 illustrates the relative contribution to the 2023 emissions inventory by source category. A comparison of Figures 3.2-3 and 3.2-4 indicates that the on-road mobile category continues to be a major contributor to CO and NOx emissions. However, due to already-adopted regulations, on-road mobile sources in 2023 account for: about 16 percent of total VOC emissions compared to 33 percent in 2008; about ~~37~~ 36 percent of total NOx emissions compared to 59 percent in 2008; and about 38 percent of total CO emissions compared to 27 percent in 2008. Meanwhile, area sources became a major contributor to VOC emissions from 17 percent in 2008 to 25 percent in 2023.

TABLE 3.2-4A

Summary of Emissions By Major Source Category: 2014 Baseline
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
STATIONARY SOURCES					
Fuel Combustion	13	~~23~~ 27	54	2	6
Waste Disposal	12	1	1	0	0
Cleaning and Surface Coatings	39	0	0	0	2
Petroleum Production and Marketing	38	0	5	1	2
Industrial Processes	13	0	2	0	7
Solvent Evaporation					
Consumer Products	85	0	0	0	0
Architectural Coatings	15	0	0	0	0
Others	2	0	0	0	0
Misc. Processes	17	21	102	1	33
RECLAIM Sources	0	27	0	8	0
Total Stationary Sources	**234**	**~~73~~ 77**	**163**	**~~14~~ 12**	**~~48~~ 49**
MOBILE SOURCES					
On-Road Vehicles	117	272	1,165	2	12
Off-Road Vehicles	100	157	766	4	8
Total Mobile Sources	**217**	**429**	**1,931**	**6**	**20**
TOTAL	**451**	**~~502~~ 506**	**2,095**	**~~54~~ 18**	**~~80~~ 70**

[a] Values are rounded to nearest integer.

TABLE 3.2-4B

Summary of Emissions By Major Source Category: 2014 Baseline Summer Planning Inventory (tpd[a])

SOURCE CATEGORY	SUMMER OZONE PRECURSORS	
	VOC	NOx
Stationary Sources		
Fuel Combustion	13	~~23~~ 28
Waste Disposal	12	2
Cleaning and Surface Coatings	45	0
Petroleum Production and Marketing	38	0
Industrial Processes	15	0
Solvent Evaporation		
Consumer Products	86	0
Architectural Coatings	18	0
Others	2	0
Misc. Processes	10	15
RECLAIM Sources	0-	27
Total Stationary Sources	**239**	**~~68~~ 72**
Mobile Sources		
On-Road Vehicles	120	251
Off-Road Vehicles	128	161
Total Mobile Sources	248	412
TOTAL	**~~488~~ 487**	**~~480~~ 480**

[a] Values are rounded to nearest integer.

TABLE 3.2-5A

Summary of Emissions By Major Source Category: 2019 Baseline
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
Stationary Sources					
Fuel Combustion	14	~~22~~ 27	56	2	6
Waste Disposal	13	2	1	0	0
Cleaning and Surface Coatings	46	0	0	0	2
Petroleum Production and Marketing	36	0	5	1	2
Industrial Processes	15	0	2	0	8
Solvent Evaporation					
Consumer Products	87	0	0	0	0
Architectural Coatings	16	0	0	0	0
Others	2	0	0	0	0
Misc. Processes*	16	18	102	1	34
RECLAIM Sources	0	27	0	6	0
Total Stationary Sources	**245**	**~~69~~ 74**	**165**	**11**	**52**
Mobile Sources					
On-Road Vehicles	80	186	755	2	11
Off-Road Vehicles	90	145	796	5	7
Total Mobile Sources	170	331	1,550	7	18
TOTAL	**415**	**~~400~~ 405**	**1,716**	**18**	**70**

[a] Values are rounded to nearest integer.

TABLE 3.2-5B

Summary of Emissions By Major Source Category: 2019 Baseline Summer Planning Inventory (tpd[a])

STATIONARY SOURCES	SUMMER OZONE PRECURSORS	
	VOC	~~VOC~~ NOx
Fuel Combustion	14	~~22~~ 28
Waste Disposal	13	2
Cleaning and Surface Coatings	53	0
Petroleum Production and Marketing	36	0
Industrial Processes	17	0
Solvent Evaporation		
Consumer Products	89	0
Architectural Coatings	19	0
Others	2	0
Misc. Processes	9	13
RECLAIM Sources		27
Total Stationary Sources	**252**	**~~65~~ 70**
Mobile Sources		
On-Road Vehicles	83	173
Off-Road Vehicles	114	148
Total Mobile Sources	**197**	**321**
TOTAL	**448**	**~~385~~ 391**

[a] Values are rounded to nearest integer.

TABLE 3.2-6A

Summary of Emissions By Major Source Category: 2023 Baseline
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
Stationary Sources					
Fuel Combustion	14	~~21~~ 27	56	2	6
Waste Disposal	14	2	1	0	0
Cleaning and Surface Coatings	49	0	0	0	2
Petroleum Production and Marketing	36	0	5	1	2
Industrial Processes	16	0	2	0	8
Solvent Evaporation					
Consumer Products	89	0	0	0	0
Architectural	17	0	0	0	0
Others	2	0	0	0	0
Misc. Processes*	16	17	102	1	35
RECLAIM Sources	0	27	0	6	0
Total Stationary Sources	**253**	**~~67~~ 73**	**166**	**11**	**53**
Mobile Sources					
On-Road Vehicles	67	126	591	2	11
Off-Road Vehicles	85	130	826	6	7
Total Mobile Sources	**153**	**255**	**1,417**	**8**	**18**
TOTAL	**406**	**~~322~~ 328**	**1,583**	**18**	**71**

[a] Values are rounded to nearest integer.

TABLE 3.2-6B

Summary of Emissions By Major Source Category: 2023 Baseline
Summer Planning Inventory (tpd[a])

SOURCE CATEGORY	Summer Ozone Precursors	
	VOC	NOx
Stationary Sources		
Fuel Combustion	14	~~21~~ 27
Waste Disposal	14	2
Cleaning and Surface Coatings	56	0
Petroleum Production and Marketing	37	0
Industrial Processes	18	0
Solvent Evaporation		
Consumer Products	91	0
Architectural	20	0
Others	3	0
Misc. Processes	9	13
RECLAIM Sources		27
Total Stationary Sources	261	~~64~~ 70
Mobile Sources		
On-Road Vehicles	70	117
Off-Road Vehicles	108	133
Total Mobile Sources	177	250
TOTAL	**438**	**~~313~~ 319**

[a] Values are rounded to nearest integer.

TABLE 3.2-7A

Summary of Emissions By Major Source Category: 2030 Baseline
Average Annual Day (tpd[a])

SOURCE CATEGORY	VOC	NOx	CO	SOx	PM2.5
Stationary Sources					
Fuel Combustion	15	~~21~~ 28	59	3	6
Waste Disposal	15	2	1	1	0
Cleaning and Surface Coatings	54	0	0	0	2
Petroleum Production and Marketing	38	0	5	1	2
Industrial Processes	17	0	2	0	9
Solvent Evaporation					
Consumer Products	93	0	0	0	0
Architectural	18	0	0	0	0
Others	2	0	0	0	0
Misc. Processes*	16	15	102	1	36
RECLAIM Sources		27		6	0
Total Stationary Sources	**268**	**~~65~~ 72**	**169**	**11**	**55**
Mobile Sources					
On-Road Vehicles	55	101	446	2	12
Off-Road Vehicles	84	116	886	7	6
Total Mobile Sources	139	217	1,333	9	18
TOTAL	**407**	**~~283~~ 289**	**1,501**	**20**	**73**

[a] Values are rounded to nearest integer.

TABLE 3.2-7B

Summary of Emissions By Major Source Category: 2030 Baseline Summer Planning Inventory (tpd[a])

SOURCE CATEGORY	Summer Ozone Precursors	
	VOC	NOx
Stationary Sources		
Fuel Combustion	15	~~22~~ 29
Waste Disposal	15	2
Cleaning and Surface Coatings	62	0
Petroleum Production and Marketing	38	0
Industrial Processes	19	0
Solvent Evaporation		
Consumer Products	95	0
Architectural	~~20~~ 21	0
Others	3	0
Misc. Processes	9	12
RECLAIM Sources	0	27
Total Stationary Sources	**~~276~~ 277**	**~~63~~ 70**
Mobile Sources		
On-Road Vehicles	56	95
Off-Road Vehicles	105	119
Total Mobile Sources	**161**	**214**
TOTAL	**437**	**~~277~~ 284**

[a] Values are rounded to nearest integer.

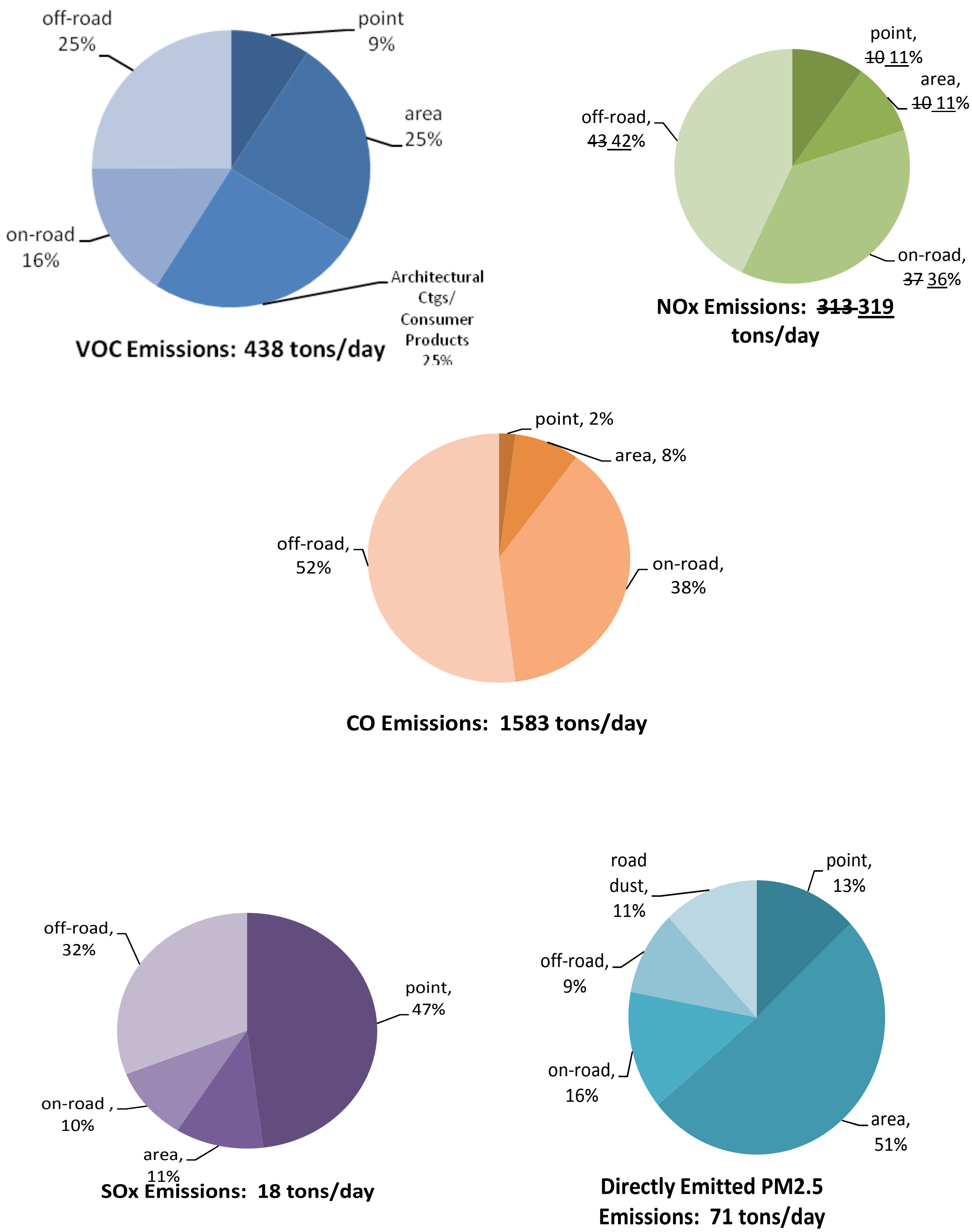

FIGURE 3.2-4

Relative Contribution by Source Category to 2023 Emission Inventory
(VOC & NOx – Summer Planning; CO, SOx, & PM2.5 – Annual Average Inventory)

3.2.1.2 Air Quality Monitoring

This section provides an overview of air quality in the district. A more detailed discussion of current and projected future air quality in the district, with and without additional control measures can be found in the Final Program EIR for the 2012 AQMP (Chapter 3).

It is the responsibility of the SCAQMD to ensure that state and federal ambient air quality standards are achieved and maintained in its geographical jurisdiction. Health-based air quality standards have been established by California and the federal government for the following criteria air pollutants: ozone, CO, NO2, PM10, PM2.5 SO2 and lead. These standards were established to protect sensitive receptors with a margin of safety from adverse health impacts due to exposure to air pollution. The California standards are more stringent than the federal standards and in the case of PM10 and SO2, far more stringent. California has also established standards for sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride. The state and national ambient air quality standards for each of these pollutants and their effects on health are summarized in Table 3.2-8. The SCAQMD monitors levels of various criteria pollutants at 34 monitoring stations. The 2010 air quality data from SCAQMD's monitoring stations are presented in Table 3.2-9.

3.2.1.2.1 Carbon Monoxide

CO is a colorless, odorless, relatively inert gas. It is a trace constituent in the unpolluted troposphere, and is produced by both natural processes and human activities. In remote areas far from human habitation, carbon monoxide occurs in the atmosphere at an average background concentration of 0.04 ppm, primarily as a result of natural processes such as forest fires and the oxidation of methane. Global atmospheric mixing of CO from urban and industrial sources creates higher background concentrations (up to 0.20 ppm) near urban areas. The major source of CO in urban areas is incomplete combustion of carbon-containing fuels, mainly gasoline. According to the 2007 AQMP, in 2002, the inventory baseline year, approximately 98 percent of the CO emitted into the Basin's atmosphere was from mobile sources. Consequently, CO concentrations are generally highest in the vicinity of major concentrations of vehicular traffic.

CO is a primary pollutant, meaning that it is directly emitted into the air, not formed in the atmosphere by chemical reaction of precursors, as is the case with ozone and other secondary pollutants. Ambient concentrations of CO in the Basin exhibit large spatial and temporal variations due to variations in the rate at which CO is emitted and in the meteorological conditions that govern transport and dilution. Unlike ozone, CO tends to reach high concentrations in the fall and winter months. The highest concentrations frequently occur on weekdays at times consistent with rush hour traffic and late night during the coolest, most stable portion of the day.

TABLE 3.2-8

State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard[a]	Federal Primary Standard[b]	Most Relevant Effects
Ozone (0_3)	1-hour	0.09 ppm (180 µg/m^3)	No Federal Standard	(a) Short-term exposures: 1) Pulmonary function decrements and localized lung edema in humans and animals; and, 2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; and, (d) Property damage.
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	
Suspended Particulate Matter (PM10)	24-hour	50 µg/m^3	150 µg/m^3	(a) Excess deaths from short-term exposures and exacerbation of symptoms in sensitive patients with respiratory disease; and (b) Excess seasonal declines in pulmonary function, especially in children.
	Annual Arithmetic Mean	20 µg/m^3	No Federal Standard	
Suspended Particulate Matter (PM2.5)	24-hour	No State Standard	35 µg/m^3	(a) Increased hospital admissions and emergency room visits for heart and lung disease; (b) Increased respiratory symptoms and disease; and (c) Decreased lung functions and premature death.
	Annual Arithmetic Mean	12 µg/m^3	15.0 µg/m^3	
Carbon Monoxide (CO)	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; and, (d) Possible increased risk to fetuses.
	8-Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	

TABLE 3.2-8 (Concluded)

State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	State Standard[a]	Federal Primary Standard[b]	Most Relevant Effects
Nitrogen Dioxide (NO_2)	1-Hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; and, (c) Contribution to atmospheric discoloration.
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	
Sulfur Dioxide (SO_2)	1-Hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)–	Broncho-constriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma.
	24-Hour	0.04 ppm (105 µg/m^3)		
Sulfates	24-Hour	25 µg/m^3	No Federal Standard	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; and, (f) Property damage
Hydrogen Sulfide (H_2S)	1-Hour	0.03 ppm (42 µg/m^3)	No Federal Standard	Odor annoyance.
Lead (Pb)	30-Day Average	1.5 µg/m^3	No Federal Standard	(a) Increased body burden; and (b) Impairment of blood formation and nerve conduction.
	Calendar Quarter	No State Standard	1.5 µg/m^3	
	Rolling 3-Month Average	No State Standard	0.15 µg/m^3	
Visibility Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer - visibility of ten miles or more due to particles when relative humidity is less than 70 percent.	No Federal Standard	The Statewide standard is intended to limit the frequency and severity of visibility impairment due to regional haze. This is a visibility based standard not a health based standard. Nephelometry and AISI Tape Sampler; instrumental measurement on days when relative humidity is less than 70 percent.
Vinyl Chloride	24-Hour	0.01 ppm (26 µg/m^3)	No Federal Standard	Highly toxic and a known carcinogen that causes a rare cancer of the liver.

a The California ambient air quality standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and PM_{25} are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

b The national ambient air quality standards, other than O3 and those based on annual averages, are not to be exceeded more than once a year. The O3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standards is equal to or less than one.

KEY: ppb = parts per billion parts of air, by volume; ppm = parts per million parts of air, by volume; µg/m^3 = micrograms per cubic meter; mg/ m^3 = milligrams per cubic meter

TABLE 3.2-9

2010 Air Quality Data – South Coast Air Quality Management District

CARBON MONOXIDE (CO)[a]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. ppm, 1-hour	Max. Conc. ppm, 8-hour
LOS ANGELES COUNTY				
1	Central Los Angeles	364	3	2.3
2	Northwest Coastal Los Angeles County	364	2	1.4
3	Southwest Coastal Los Angeles County	344	3	2.2
4	South Coastal Los Angeles County 1	358	3	2.1
4	South Coastal Los Angeles County 2	-	-	-
6	West San Fernando Valley	365	3	2.6
7	East San Fernando Valley	364	3	2.4
8	West San Gabriel Valley	355	3	2.0
9	East San Gabriel Valley 1	355	3	1.3
9	East San Gabriel Valley 2	360	2	1.3
10	Pomona/Walnut Valley	365	3	1.8
11	South San Gabriel Valley	364	2	1.9
12	South Central Los Angeles County	353	6	3.6
13	Santa Clarita Valley	355	2	1.1
ORANGE COUNTY				
16	North Orange County	356	3	1.8
17	Central Orange County	358	3	2.0
18	North Coastal Orange County	364	2	2.1
19	Saddleback Valley	362	1	0.9
RIVERSIDE COUNTY				
22	Norco/Corona	-	-	-
23	Metropolitan Riverside County 1	364	3	1.8
23	Metropolitan Riverside County 2	355	3	1.7
23	Mira Loma	360	3	1.9
24	Perris Valley	-	-	-
25	Lake Elsinore	363	1	0.6
29	Banning Airport	-	-	-
30	Coachella Valley 1**	365	2	0.5
30	Coachella Valley 2**	-	-	-
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	353	2	1.8
33	Southwest San Bernardino Valley	-	-	-
34	Central San Bernardino Valley 1	359	3	1.4
34	Central San Bernardino Valley 2	326	2	1.7
35	East San Bernardino Valley	-	-	-
37	Central San Bernardino Mountains	-	-	-
38	East San Bernardino Mountains	-	-	-
DISTRICT MAXIMUM			6	3.6
SOUTH COAST AIR BASIN			6	3.6

KEY:

ppm = parts per million　　-- = Pollutant not monitored　　** Salton Sea Air Basin

[a] The federal 8-hour standard (8-hour average CO > 9 ppm) and state 8-hour standard (8-hour average CO > 9.0 ppm) were not exceeded. The federal and state 1-hour standards (35 ppm and 20 ppm) were not exceeded either.

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

OZONE (O_3)										
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. in ppm 1-hr	Max. Conc. in ppm 8-hr	4th High Conc. ppm 8-hr	No. Days Standard Exceeded: Health Advisory ≥ 0.15 ppm 1-hr	Federal: Old > 0.12 ppm 1-hr	Federal: Current >0.075 ppm 8-hr	State: Current > 0.09 ppm 1-hr	State: Current > 0.070 ppm 8-hr
LOS ANGELES COUNTY										
1	Central Los Angeles	357	0.098	0.080	0.064	0	0	1	1	1
2	Northwest Coastal Los Angeles County	360	0.099	0.078	0.069	0	0	1	2	4
3	Southwest Coastal Los Angeles County	319	0.089	0.070	0.059	0	0	0	0	1
4	South Coastal Los Angeles County 1	358	0.101	0.084	0.057	0	0	1	1	1
4	South Coastal Los Angeles County 2	-	-	-	-	-	-	-	-	-
6	West San Fernando Valley	295	0.122	0.091	0.086	0	0	19	11	40
7	East San Fernando Valley	317	0.111	0.084	0.076	0	0	4	3	11
8	West San Gabriel Valley	325	0.101	0.081	0.075	0	0	3	1	6
9	East San Gabriel Valley 1	356	0.104	0.081	0.075	0	0	3	5	10
9	East San Gabriel Valley 2	350	0.124	0.099	0.090	0	0	20	25	48
10	Pomona/Walnut Valley	342	0.115	0.082	0.076	0	0	4	9	20
11	South San Gabriel Valley	358	0.112	0.086	0.059	0	0	1	1	1
12	South Central Los Angeles County	358	0.081	0.062	0.050	0	0	0	0	0
13	Santa Clarita Valley	331	0.126	0.105	0.087	0	0	23	18	44
ORANGE COUNTY										
16	North Orange County	351	0.118	0.096	0.071	0	0	1	2	4
17	Central Orange County	331	0.104	0.088	0.060	0	0	1	1	1
18	North Coastal Orange County	353	0.097	0.076	0.060	0	0	1	1	2
19	Saddleback Valley	353	0.117	0.082	0.069	0	0	2	2	2
RIVERSIDE COUNTY										
22	Norco/Corona	-	-	-	-	-	-	-	-	-
23	Metropolitan Riverside County 1	341	0.128	0.098	0.092	0	1	47	31	78
23	Metropolitan Riverside County 2	-	-	-	-	-	-	-	-	-
23	Mira Loma	324	0.121	0.094	0.090	0	0	38	22	63
24	Perris Valley	343	0.122	0.107	0.099	0	0	50	42	82
25	Lake Elsinore	355	0.107	0.091	0.086	0	0	24	15	42
29	Banning Airport	328	0.124	0.107	0.099	0	0	60	31	84
30	Coachella Valley 1**	361	0.114	0.099	0.092	0	0	52	23	83
30	Coachella Valley 2**	348	0.100	0.087	0.084	0	0	19	7	47
SAN BERNARDINO COUNTY										
32	Northwest San Bernardino Valley	349	0.131	0.097	0.090	0	1	39	31	59
33	Southwest San Bernardino Valley	-	-	-	-	-	-	-	-	-
34	Central San Bernardino Valley 1	350	0.143	0.100	0.094	0	2	33	28	55
34	Central San Bernardino Valley 2	354	0.129	0.105	0.095	0	1	40	27	63
35	East San Bernardino Valley	363	0.128	0.112	0.097	0	1	61	43	86
37	Central San Bernardino Mountains	364	0.142	0.123	0.109	0	6	74	52	101
38	East San Bernardino Mountains	-	-	-	-	-	-	-	-	-
	DISTRICT MAXIMUM		0.143	0.123	0.109	0	6	74	52	101
	SOUTH COAST AIR BASIN		0.143	0.123	0.109	0	7	102	79	131

KEY:

ppm = parts per million -- = Pollutant not monitored ** Salton Sea Air Basin

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

NITROGEN DIOXIDE (NO_2)[b]					
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	1-hour Max. Conc. ppb, 1,	1-hour 98th Percentile Conc. ppb,	Annual Average AAM Conc. ppb
LOS ANGELES COUNTY					
1	Central Los Angeles	364	89.0	70.5	25.0
2	Northwest Coastal Los Angeles County	365	70.8	57.4	15.6
3	Southwest Coastal Los Angeles County	358	75.8	60.9	12.1
4	South Coastal Los Angeles County 1	360	92.8	70.2	19.8
4	South Coastal Los Angeles County 2	-			-
6	West San Fernando Valley	365	75.0	56.0	16.7
7	East San Fernando Valley	359	82.0	64.3	24.1
8	West San Gabriel Valley	355	71.0	63.0	19.6
9	East San Gabriel Valley 1	364	77.2	59.6	18.5
9	East San Gabriel Valley 2	360	78.5	55.5	15.4
10	Pomona/Walnut Valley	365	97.0	72.5	26.2
11	South San Gabriel Valley	364	79.0	65.4	22.9
12	South Central Los Angeles County	364	76.8	68.8	17.9
13	Santa Clarita Valley	364	59.3	54.2	14.3
ORANGE COUNTY					
16	North Orange County	333	82.5	61.6	20.1
17	Central Orange County	364	73.3	61.1	17.5
18	North Coastal Orange County	364	70.0	56.0	11.3
19	Saddleback Valley	-			-
RIVERSIDE COUNTY					
22	Norco/Corona	-			-
23	Metropolitan Riverside County 1	333	64.5	57.0	16.8
23	Metropolitan Riverside County 2	361	60.8	51.5	17.2
23	Mira Loma	365	62.2	50.3	15.1
24	Perris Valley	-			-
25	Lake Elsinore	363	51.2	40.6	10.1
29	Banning Airport	365	65.7	53.2	11.6
30	Coachella Valley 1**	365	45.7	39.0	8.5
30	Coachella Valley 2**	-			-
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	365	78.9	58.0	20.4
33	Southwest San Bernardino Valley	-			-
34	Central San Bernardino Valley 1	363	71.9	64.8	23.1
34	Central San Bernardino Valley 2	365	69.2	56.6	18.8
35	East San Bernardino Valley	-			-
37	Central San Bernardino Mountains	-			-
38	East San Bernardino Mountains	-			-
DISTRICT MAXIMUM			97.0	72.5	26.2
SOUTH COAST AIR BASIN			97.0	72.5	26.2

KEY:

ppb = parts per billion AAM = Annual Arithmetic Mean -- = Pollutant not monitored ** Salton Sea Air Basin

b The NO2 federal 1-hour standard is 100 ppb and the annual standard is annual arithmetic mean NO_2 > 0.0534 ppm. The state 1-hour and annual standards are 0.18 ppm and 0.030 ppm.

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

SULFUR DIOXIDE (SO_2)[c]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Maximum Conc. ppb, 1-hour	Maximum Conc. ppb, 24-hour
LOS ANGELES COUNTY				
1	Central Los Angeles	355	9.8	1.5
2	Northwest Coastal Los Angeles County	-	-	-
3	Southwest Coastal Los Angeles County	327	25.9	3.5
4	South Coastal Los Angeles County 1	329	40.0	6.0
4	South Coastal Los Angeles County 2	-	-	-
6	West San Fernando Valley	-	-	-
7	East San Fernando Valley	233*	14.9	4.1
8	West San Gabriel Valley	-	-	-
9	East San Gabriel Valley 1	-	-	-
9	East San Gabriel Valley 2	-	-	-
10	Pomona/Walnut Valley	-	-	-
11	South San Gabriel Valley	-	-	-
12	South Central Los Angeles County	-	-	-
13	Santa Clarita Valley	-	-	-
ORANGE COUNTY				
16	North Orange County	-	-	-
17	Central Orange County	-	-	-
18	North Coastal Orange County	348	9.5	2.1
19	Saddleback Valley	-	-	-
RIVERSIDE COUNTY				
22	Norco/Corona	-	-	-
23	Metropolitan Riverside County 1	349	17.6	4.6
23	Metropolitan Riverside County 2	-	-	-
23	Mira Loma	-	-	-
24	Perris Valley	-	-	-
25	Lake Elsinore	-	-	-
29	Banning Airport	-	-	-
30	Coachella Valley 1**	-	-	-
30	Coachella Valley 2**	-	-	-
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	-	-	-
33	Southwest San Bernardino Valley	-	-	-
34	Central San Bernardino Valley 1	330*	6.6	1.6
34	Central San Bernardino Valley 2	-	-	-
35	East San Bernardino Valley	-	-	-
37	Central San Bernardino Mountains	-	-	-
38	East San Bernardino Mountains	-	-	-
DISTRICT MAXIMUM			40.0	6.0
SOUTH COAST AIR BASIN			40.0	6.0

KEY:

ppb = parts per billion -- = Pollutant not monitored ** Salton Sea Air Basin

[c] The federal SO2 1-hour standard is 75 ppb (0.075 ppm). The state standards are 1-hour average SO_2 > 0.25 ppm and 24-hour average SO_2 > 0.04 ppm.

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM10[d]						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. μg/m³, 24-hour	No. (%) Samples Exceeding Standard		Annual Average AAM Conc. μg/m³
				Federal > 150 μg/m³, 24-hour	State > 50 μg/m³, 24-hour	
LOS ANGELES COUNTY						
1	Central Los Angeles	56	42	0	0	27.1
2	Northwest Coastal Los Angeles County	-	-	-	-	-
3	Southwest Coastal Los Angeles County	55	37	0	0	20.6
4	South Coastal Los Angeles County 1	58	44	0	0	22.0
4	South Coastal Los Angeles County 2	59	76	0	2(3.4%)	27.3
6	West San Fernando Valley	-	-	-	-	-
7	East San Fernando Valley	55	51	0	1(1.8%)	29.6
8	West San Fernando Valley	-	-	-	-	-
9	East San Gabriel Valley 1	55	70	0	5(9.1%)	29.8
9	East San Gabriel Valley 2	-	-	-	-	-
10	Pomona/Walnut Valley	-	-	-	-	-
11	South San Gabriel Valley	-	-	-	-	-
12	South Central Los Angeles County	-	-	-	-	-
13	Santa Clarita Valley	57	40	0	0	21.0
ORANGE COUNTY						
16	North Orange County	-	-	-	-	-
17	Central Orange County	57	43	0	0	22.4
18	North Coastal Orange County	-	-	-	-	-
19	Saddleback Valley	58	34	0	0	18.1
RIVERSIDE COUNTY0						
22	Norco/Corona	61	50	0	0	27.2
23	Metropolitan Riverside County 1	122	75	0	7(5.7%)	32.8
23	Metropolitan Riverside County 2	-	-	-	-	-
23	Mira Loma	60	89	0	25(41.7%)	42.3
24	Perris Valley	61	51	0	1(1.6%)	28.0
25	Lake Elsinore	-	-	-	-	-
29	Banning Airport	60	55	0	1(1.7%)	21.8
30	Coachella Valley 1**	61	37	0	0	18.7
30	Coachella Valley 2**	119	107	0	6(5%)	29.3
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	-	-	-	-	-
33	Southwest San Bernardino Valley	60	87	0	3(5%)	31.8
34	Central San Bernardino Valley 1	53	62	0	9(17%)	33.9
34	Central San Bernardino Valley 2	59	63	0	3(5.1%)	32.4
35	East San Bernardino Valley	58	57	0	1(1.7%)	25.8
37	Central San Bernardino Mountains	57	39	0	0	18.9
38	East San Bernardino Mountains	-	-	-	-	-
	DISTRICT MAXIMUM		107	0	25	42.3
	SOUTH COAST AIR BASIN		89	0	34	42.3

KEY:

μg/m³ = micrograms per cubic meter of air AAM = Annual Arithmetic Mean -- = Pollutant not monitored ** Salton Sea Air Basin

[d] PM10 samples were collected every 6 days at all sites except for Station Numbers 4144 and 4157, where samples were collected every 3 days. The Federal annual PM10 standard (AAM > 50 μg/m³) was revoked in 2006. State standard is annual average (AAM) > 20 μg/m³

TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

SUSPENDED PARTICULATE MATTER PM2.5 [e]						
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. $\mu g/m^3$, 24-hour	98th Percentile Conc. in $\mu g/m^3$ 24-hr	No. (%) Samples Exceeding Federal Std > 35 $\mu g/m^3$, 24-hour	Annual Average AAM Conc. $\mu g/m^3$
LOS ANGELES COUNTY						
1	Central Los Angeles	335	39.2	27.1	2(0.6%)	11.9
2	Northwest Coastal Los Angeles County	-	-	-	-	-
3	Southwest Coastal Los Angeles County	-	-	-	-	-
4	South Coastal Los Angeles County 1	338	35.0	28.3	0	10.5
4	South Coastal Los Angeles County 2	351	33.7	26.5	0	10.4
6	West San Fernando Valley	100	40.7	30.4	1(1.0%)	10.2
7	East San Fernando Valley	322	43.7	31.8	4(1.2%)	12.5
8	West San Gabriel Valley	97	35.2	24.0	0	10.2
9	East San Gabriel Valley 1	93	44.4	35.4	1(1.1%)	10.9
9	East San Gabriel Valley 2	-	-	-	-	-
10	Pomona/Walnut Valley	-	-	-	-	-
11	South San Gabriel Valley	117	34.9	32.0	0	12.5
12	South Central Los Angeles County	111	38.2	31.8	1(0.9%)	12.5
13	Santa Clarita Valley	-	-	-	-	-
ORANGE COUNTY						
16	North Orange County	-	-	-	-	-
17	Central Orange County	331	31.7	25.2	0	10.2
18	North Coastal Orange County	-	-	-	-	-
19	Saddleback Valley	116	19.9	17.3	0	8.0
RIVERSIDE COUNTY						
22	Norco/Corona	-	-	-	-	-
23	Metropolitan Riverside County 1	351	46.5	32.0	4(1.1%)	13.2
23	Metropolitan Riverside County 2	115	43.7	27.3	2(1.7%)	11.0
23	Mira Loma	340	54.2	36.1	8(2.4%)	15.2
24	Perris Valley	-	-	-	-	-
25	Lake Elsinore	-	-	-	-	-
29	Banning Airport	-	-	-	-	-
30	Coachella Valley 1**	111	12.8	12.6	0	6.0
30	Coachella Valley 2**	112	16.0	12.2	0	6.8
SAN BERNARDINO COUNTY						
32	Northwest San Bernardino Valley	-	-	-	-	-
33	Southwest San Bernardino Valley	112	46.1	31.2	1(0.9%)	13.0
34	Central San Bernardino Valley 1	112	42.6	30.8	2(1.8%)	12.0
34	Central San Bernardino Valley 2	119	39.3	29.7	2(1.7%)	11.1
35	East San Bernardino Valley	-	-	-	-	-
37	Central San Bernardino Mountains	-	-	-	-	-
38	East San Bernardino Mountains	53	35.4	27.5	0	8.4
DISTRICT MAXIMUM			54.2	36.1	8	15.2
SOUTH COAST AIR BASIN			54.2	36.1	13	15.2

KEY:

$\mu g/m^3$ = micrograms per cubic meter of air   AAM = Annual Arithmetic Mean   -- = Pollutant not monitored   ** Salton Sea Air Basin

[e] PM2.5 samples were collected every 3 days at all sites except for station numbers 069, 072, 077, 087, 3176, 4144 and 4165, where samples were taken daily, and station number 5818 where samples were taken every 6 days. Federal annual PM2.5 standard is annual average (AAM) > 15.0 $\mu g/m^3$. State standard is annual average (AAM) > 12.0 $\mu g/m^3$.

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TABLE 3.2-9 (Continued)

2010 Air Quality Data – South Coast Air Quality Management District

TOTAL SUSPENDED PARTICULATES TSP[f]				
Source Receptor Area No.	Location of Air Monitoring Station	No. Days of Data	Max. Conc. $\mu g/m^3$, 24-hour	Annual Average AAM Conc. $\mu g/m^3$
LOS ANGELES COUNTY				
1	Central Los Angeles	53	105	53.3
2	Northwest Coastal Los Angeles County	59	82	40.8
3	Southwest Coastal Los Angeles County	55	85	36.7
4	South Coastal Los Angeles County 1	60	129	45.5
4	South Coastal Los Angeles County 2	57	130	50.8
6	West San Fernando Valley	-	-	-
7	East San Fernando Valley	-	-	-
8	West San Gabriel Valley	58	58	36.4
9	East San Gabriel Valley 1	53	136	58.2
9	East San Gabriel Valley 2	-	-	-
10	Pomona/Walnut Valley	-	-	-
11	South San Gabriel Valley	59	265	86.1
12	South Central Los Angeles County	58	94	49.2
13	Santa Clarita Valley	-	-	-
ORANGE COUNTY				
16	North Orange County	-	-	-
17	Central Orange County	-	-	-
18	North Coastal Orange County	-	-	-
19	Saddleback Valley	-	-	-
RIVERSIDE COUNTY				
22	Norco/Corona	-	-	-
23	Metropolitan Riverside County 1	60	131	64.3
23	Metropolitan Riverside County 2	59	88	45.0
23	Mira Loma	-	-	-
24	Perris Valley	-	-	-
25	Lake Elsinore	-	-	-
29	Banning Airport	-	-	-
30	Coachella Valley 1**	-	-	-
30	Coachella Valley 2**	-	-	-
SAN BERNARDINO COUNTY				
32	Northwest San Bernardino Valley	59	86	46.7
33	Southwest San Bernardino Valley	-	-	-
34	Central San Bernardino Valley 1	61	142	73.3
34	Central San Bernardino Valley 2	60	106	57.7
35	East San Bernardino Valley	-	-	-
37	Central San Bernardino Mountains	-	-	-
38	East San Bernardino Mountains	-	-	-
DISTRICT MAXIMUM			265	86.1
SOUTH COAST AIR BASIN			265	86.1

KEY:

$\mu g/m^3$ = micrograms per cubic meter of air AAM = Annual Arithmetic Mean -- = Pollutant not monitored ** Salton Sea Air Basin

f TSP Particulate samples were taken every six days at all sites monitored..

TABLE 3.2-9 (Concluded)

2010 Air Quality Data – South Coast Air Quality Management District

Source Receptor Area No.	Location of Air Monitoring Station	LEAD[g] Max. Monthly Average Conc. m) $\mu g/m^3$	LEAD[g] Max. Quarterly Average Conc. m) $\mu g/m^3$	SULFATES (SOx)[g] Max. Conc. $\mu g/m^3$, 24-hour	SULFATES (SOx)[g] No. (%) Samples Exceeding State Standard ≥ 25 $\mu g/m^3$, 24-hour
LOS ANGELES COUNTY					
1	Central Los Angeles	0.02	0.01	9.1	0
2	Northwest Coastal Los Angeles County	--	--	7.5	0
3	Southwest Coastal Los Angeles County	0.01	0.01	9.7	0
4	South Coastal Los Angeles County 1	0.01	0.01	11.8	0
4	South Coastal Los Angeles County 2	0.01	0.01	12.2	0
6	West San Fernando Valley	--	--	-	-
7	East San Fernando Valley	--	--	-	-
8	West San Gabriel Valley	--	--	7.7	0
9	East San Gabriel Valley 1	--	--	6.4	0
9	East San Gabriel Valley 2	--	--	-	-
10	Pomona/Walnut Valley	--	--	--	--
11	South San Gabriel Valley	0.02	0.01	8.5	0
12	South Central Los Angeles County	0.01	0.01	7.8	0
13	Santa Clarita Valley	--	--	--	--
ORANGE COUNTY					
16	North Orange County	--	--	--	--
17	Central Orange County	--	--	--	--
18	North Coastal Orange County	--	--	--	--
19	Saddleback Valley	--	--	--	--
RIVERSIDE COUNTY					
22	Norco/Corona	--	--	--	--
23	Metropolitan Riverside County 1	0.01	0.01	6.7	0
23	Metropolitan Riverside County 2	0.01	0.01	5.0	0
23	Mira Loma	--	--	--	--
24	Perris Valley	--	--	--	--
25	Lake Elsinore	--	--	--	--
29	Banning Airport	--	--	--	--
30	Coachella Valley 1**	--	--	--	--
30	Coachella Valley 2**	--	--	--	--
SAN BERNARDINO COUNTY					
32	Northwest San Bernardino Valley	0.01	0.01	10.1	0
33	Southwest San Bernardino Valley	--	--	--	--
34	Central San Bernardino Valley 1	--	--	6.3	0
34	Central San Bernardino Valley 2	0.01	0.01	11.4	0
35	East San Bernardino Valley	--	--	--	--
37	Central San Bernardino Mountains	--	--	--	--
38	East San Bernardino Mountains	--	--	--	--
DISTRICT MAXIMUM		0.02	0.01	12.2	0
SOUTH COAST AIR BASIN		0.02	0.01	12.2	0

KEY:

$\mu g/m^3$ = micrograms per cubic meter of air -- = Pollutant not monitored ** Salton Sea Air Basin

[g] Lead and sulfate samples were collected every six days at all sites monitored.

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply to the heart.

Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses (unborn babies), and patients with chronic hypoxemia (oxygen deficiency) as seen in high altitudes.

Reductions in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels. These include pre-term births and heart abnormalities.

Carbon monoxide concentrations were measured at 25 locations in the Basin and neighboring SSAB areas in 2010. Carbon monoxide concentrations did not exceed the standards in 2010. The highest one-hour average carbon monoxide concentration recorded (6.0 ppm in the South Central Los Angeles County area) was 17 percent of the federal one-hour carbon monoxide standard of 35 ppm. The highest eight-hour average carbon monoxide concentration recorded (3.6 ppm in the South Central Los Angeles County area) was 40 percent of the federal eight-hour carbon monoxide standard of 9.0 ppm. The state one-hour standard is also 9.0 ppm. The highest eight-hour average carbon monoxide concentration is 18 percent of the state eight-hour carbon monoxide standard of 20 ppm.

The 2003 AQMP revisions to the SCAQMD's CO Plan served two purposes: it replaced the 1997 attainment demonstration that lapsed at the end of 2000; and it provided the basis for a CO maintenance plan in the future. In 2004, the SCAQMD formally requested the U.S. EPA to re-designate the Basin from non-attainment to attainment with the CO National Ambient Air Quality Standards. On February 24, 2007, U.S. EPA published in the Federal Register its proposed decision to re-designate the Basin from non-attainment to attainment for CO. The comment period on the re-designation proposal closed on March 16, 2007 with no comments received by the U.S. EPA. On May 11, 2007, U.S. EPA published in the Federal Register its final decision to approve the SCAQMD's request for re-designation from non-attainment to attainment for CO, effective June 11, 2007.

3.2.1.2.2 Ozone

Ozone (O3), a colorless gas with a sharp odor, is a highly reactive form of oxygen. High ozone concentrations exist naturally in the stratosphere. Some mixing of stratospheric ozone downward through the troposphere to the earth's surface does occur; however, the extent of ozone transport is limited. At the earth's surface in sites remote from urban areas ozone concentrations are normally very low (e.g., from 0.03 ppm to 0.05 ppm).

While ozone is beneficial in the stratosphere because it filters out skin-cancer-causing ultraviolet radiation, it is a highly reactive oxidant. It is this reactivity which accounts for its damaging effects on materials, plants, and human health at the earth's surface.

The propensity of ozone for reacting with organic materials causes it to be damaging to living cells and ambient ozone concentrations in the Basin are frequently sufficient to cause health effects. Ozone enters the human body primarily through the respiratory tract and causes respiratory irritation and discomfort, makes breathing more difficult during exercise, and reduces the respiratory system's ability to remove inhaled particles and fight infection.

Individuals exercising outdoors, children and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term exposures (lasting for a few hours) to ozone at levels typically observed in southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in high ozone communities. Elevated ozone levels are also associated with increased school absences.

Ozone exposure under exercising conditions is known to increase the severity of the abovementioned observed responses. Animal studies suggest that exposures to a combination of pollutants which include ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

In 2010, the SCAQMD regularly monitored ozone concentrations at 28 locations in the Basin and SSAB. Maximum ozone concentrations for all areas monitored were below the stage 1 episode level (0.20 ppm) and below the health advisory level (0.15 ppm). Maximum ozone concentrations in the SSAB areas monitored by the SCAQMD were lower than in the Basin and were below the health advisory level.

In 2010, the maximum ozone concentrations in the Basin continued to exceed federal standards by wide margins. Maximum one-hour and eight-hour average ozone concentrations were 0.143 ppm and 0.123 ppm, respectively (the maximum one-hour was recorded in the Central San Bernardino Valley 1 area, the eight-hour maximum was recorded in the Central San Bernardino Mountains area). The federal one-hour ozone standard was revoked and replaced by the eight-hour average ozone standard effective June 15, 2005. U.S. EPA has revised the federal eight-hour ozone standard from 0.84 ppm to 0.075 ppm, effective May 27, 2008. The maximum eight-hour concentration was 164 percent of the new federal standard. The maximum one-hour concentration was 159 percent of the one-hour state ozone standard of 0.09 ppm. The maximum eight-hour concentration was 175 percent of the eight-hour state ozone standard of 0.070 ppm.

The objective of the 2012 AQMP is to attain and maintain ambient air quality standards. Based upon the modeling analysis described in the Program Environmental Impact Report for the 2007 AQMP, implementation of all control measures contained in the 2012 AQMP is anticipated to bring the district into compliance with the federal eight-hour ozone standard by 2023 and the state eight-hour ozone standard beyond 2023.

3.2.1.2.3 Nitrogen Dioxide

NO2 is a reddish-brown gas with a bleach-like odor. Nitric oxide (NO) is a colorless gas, formed from the nitrogen (N2) and oxygen (O2) in air under conditions of high temperature and pressure which are generally present during combustion of fuels; NO reacts rapidly with the oxygen in air to form NO2. NO2 is responsible for the brownish tinge of polluted air. The two gases, NO and NO2, are referred to collectively as NOx. In the presence of sunlight, NO2 reacts to form nitric oxide and an oxygen atom. The oxygen atom can react further to form ozone, via a complex series of chemical reactions involving hydrocarbons. Nitrogen dioxide may also react to form nitric acid (HNO3) which reacts further to form nitrates, components of PM2.5 and PM10.

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposures to NO2 at levels found in homes with gas stoves, which are higher than ambient levels found in southern California. Increase in resistance to air flow and airway contraction is observed after short-term exposure to NO2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma and/or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups. More recent studies have found associations between NO2 exposures and cardiopulmonary mortality, decreased lung function, respiratory symptoms and emergency room asthma visits.

In animals, exposure to levels of NO2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of ozone and NO2.

In 2010, nitrogen dioxide concentrations were monitored at 24 locations. No area of the Basin or SSAB exceeded the federal or state standards for nitrogen dioxide. The Basin has not exceeded the federal standard for nitrogen dioxide (0.0534 ppm) since 1991, when the Los Angeles County portion of the Basin recorded the last exceedance of the standard in any county within the United States.

In 2010, the maximum annual average concentration was 26.2 ppb recorded in the Pomona/Walnut Valley area. Effective March 20, 2008, CARB revised the nitrogen dioxide one-hour standard from 0.25 ppm to 0.18 ppm and established a new annual standard of 0.30 ppm. In addition, U.S. EPA has established a new federal one-hour NO2 standard of 100 ppb (98th percentile concentration), effective April 7, 2010. The highest one-hour average concentration recorded (97.0 ppb in Pomona/Walnut Valley) was 53 percent of the state one-hour standard and the highest annual average concentration recorded (26.2 ppb in Pomona/Walnut Valley) was 87 percent of the state annual average standard. NOx emission reductions continue to be necessary because it is a precursor to both ozone and PM (PM2.5 and PM10) concentrations.

3.2.1.2.4 Sulfur Dioxide

SO2 is a colorless gas with a sharp odor. It reacts in the air to form sulfuric acid (H2SO4), which contributes to acid precipitation, and sulfates, which are components of PM10 and PM2.5. Most of the SO2 emitted into the atmosphere is produced by burning sulfur-containing fuels.

Exposure of a few minutes to low levels of SO2 can result in airway constriction in some asthmatics. All asthmatics are sensitive to the effects of SO2. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, is observed after acute higher exposure to SO2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO2.

Animal studies suggest that despite SO2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO2 levels. In these studies, efforts to separate the effects of SO2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

No exceedances of federal or state standards for sulfur dioxide occurred in 2010 at any of the seven district locations monitored. The maximum one-hour sulfur dioxide concentration was 40.0 ppb, as recorded in the South Coastal Los Angeles County 1 area. The maximum 24-hour sulfur dioxide concentration was 6.0 ppb, as recorded in South Coastal Los Angeles County 1 area. The U.S. EPA revised the federal sulfur dioxide standard by establishing a new one-hour standard of 0.075 ppm and revoking the existing annual arithmetic mean (0.03 ppm) and the 24-hour average (0.14 ppm), effective August 2, 2010. The state standards are 0.25 ppm for the one-hour average and 0.04 ppm for the 24-hour average. Though sulfur dioxide concentrations remain well below the standards, sulfur dioxide is a precursor to sulfate, which is a component of fine particulate matter, PM10, and PM2.5. Historical measurements showed concentrations to be well below standards and monitoring has been discontinued.

3.2.1.2.5 Particulate Matter (PM10 and PM2.5)

Of great concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Respirable particles (particulate matter less than about 10 micrometers in diameter) can accumulate in the respiratory system and aggravate health problems such as asthma, bronchitis and other lung diseases. Children, the elderly, exercising adults, and those suffering from asthma are especially vulnerable to adverse health effects of PM10 and PM2.5.

A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. Studies have reported an association between long-term exposure to air pollution dominated by fine particles (PM2.5) and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in fine particulate matter concentration levels have also been related to hospital admissions for acute respiratory conditions, to school and kindergarten absences, to a decrease in respiratory function in normal children and to increased medication use in children and adults with asthma. Studies have also shown lung function growth in children is reduced with long-term exposure to particulate matter. In addition to children, the elderly, and people with pre-existing respiratory and/or cardiovascular disease appear to be more susceptible to the effects of PM10 and PM2.5.

The SCAQMD monitored PM10 concentrations at 21 locations in 2010. The federal 24-hour PM10 standard (150 µg/m3) was not exceeded at any of the locations monitored in 2010. The maximum 24-hour PM10 concentration of 107 µg/m3 was recorded in the Coachella Valley No. 2 area and was 71 percent of the federal standard and 214 percent of the much more stringent state 24-hour PM10 standard (50 µg/m3). The state 24-hour PM10 standard was exceeded at 12 of the 21 monitoring stations. The maximum annual average PM10 concentration of 42.3 µg/m3 was recorded in Mira Loma. The maximum annual average PM10 concentration in Mira Loma was 211 percent of the state standard. The federal annual PM10 standard has been revoked.

In 2010, PM2.5 concentrations were monitored at 20 locations throughout the district. U.S. EPA revised the federal 24-hour PM2.5 standard from 65 µg/m3 to 35 µg/m3, effective December 17, 2006. In 2010, the maximum PM2.5 concentrations in the Basin exceeded the new federal 24-hour PM2.5 standard in all but six locations. The maximum 24-hour PM2.5 concentration of 54.2 µg/m3 was recorded in the Mira Loma area, which represents 154 percent of the federal standard of 35 µg/m3. The maximum annual average concentration of 15.2 µg/m3 was recorded in Mira Loma, which represents 101 percent of the federal standard of 15 µg/m3 and 126 percent of the state standard of 12 µg/m3.

Similar to PM10 concentrations, PM2.5 concentrations were higher in the inland valley areas of San Bernardino and Metropolitan Riverside counties. However, PM2.5 concentrations were also high in Central Los Angeles County. The high PM2.5 concentrations in Los Angeles County are mainly due to the secondary formation of smaller particulates resulting from mobile and stationary source activities. In contrast to PM10, PM2.5 concentrations were low in the Coachella Valley area of SSAB. PM10 concentrations are normally higher in the desert areas due to windblown and fugitive dust emissions.

3.2.1.2.6 Lead

Lead in the atmosphere is present as a mixture of a number of lead compounds. Leaded gasoline and lead smelters have been the main sources of lead emitted into the air. Due to the phasing out of leaded gasoline, there was a dramatic reduction in atmospheric lead in the Basin over the past three decades.

Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased lead levels are associated with increased blood pressure.

Lead poisoning can cause anemia, lethargy, seizures, and death. It appears that there are no direct effects of lead on the respiratory system. Lead can be stored in the bone from early-age environmental exposure, and elevated blood lead levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland), and osteoporosis (breakdown of bone tissue). Fetuses and breast-fed babies can be exposed to higher levels of lead because of previous environmental lead exposure of their mothers.

The old federal and current state standards for lead were not exceeded in any area of the district in 2010. There have been no violations of these standards at the SCAQMD's regular air monitoring stations since 1982, as a result of removal of lead from gasoline. The maximum quarterly average lead concentration (0.01 µg/m3 at monitoring stations in South San Gabriel Valley, South Central Los Angeles County, and Central San Bernardino Valley No. 2) was 0.7 percent of the old federal quarterly average lead standard (1.5 µg/m3). The maximum monthly average lead concentration (0.01 µg/m3 in South San Gabriel Valley and South Central Los Angeles County), measured at special monitoring sites immediately adjacent to stationary sources of lead was 0.7 percent of the state monthly average lead standard. No lead data were obtained at SSAB and Orange County stations in 2010. Because historical lead data showed concentrations in SSAB and Orange County areas to be well below the standard, measurements have been discontinued.

On November 12, 2008, U.S. EPA published new national ambient air quality standards for lead, which became effective January 12, 2010. The existing national lead standard, 1.5 µg/m3, was reduced to 0.15 µg/m3, averaged over a rolling three-month period. The new federal standard was not exceeded at any source/receptor location in 2010. Nevertheless, U.S. EPA designated the Los Angeles County portion of the Basin as non-attainment for the new lead standard, effective December 31, 2010, primarily based on emissions from two battery recycling facilities. In response to the new federal lead standard, the SCAQMD adopted Rule 1420.1 – Emissions Standard for Lead from Large Lead-Acid Battery Recycling Facilities, in November 2010, to ensure that lead emissions do not exceed the new federal standard. Further, in May 2012, the SCAQMD adopted the 2012 Lead SIP to address the revision to the federal lead standard, which outlines the strategy and pollution control activities to demonstrate attainment of the federal lead standard before December 31, 2015.

3.2.1.2.7 Sulfates

Sulfates (SOx) are chemical compounds which contain the sulfate ion and are part of the mixture of solid materials which make up PM10. Most of the sulfates in the atmosphere are produced by oxidation of SO2. Oxidation of sulfur dioxide yields sulfur trioxide (SO3) which reacts with water to form sulfuric acid, which contributes to acid deposition. The reaction of sulfuric acid with basic substances such as ammonia yields sulfates, a component of PM10 and PM2.5.

Most of the health effects associated with fine particles and SO2 at ambient levels are also associated with SOx. Thus, both mortality and morbidity effects have been observed with an increase in ambient SOx concentrations. However, efforts to separate the effects of SOx from the effects of other pollutants have generally not been successful.

Clinical studies of asthmatics exposed to sulfuric acid suggest that adolescent asthmatics are possibly a subgroup susceptible to acid aerosol exposure. Animal studies suggest that acidic particles such as sulfuric acid aerosol and ammonium bisulfate are more toxic than non-acidic particles like ammonium sulfate. Whether the effects are attributable to acidity or to particles remains unresolved.

In 2010, the state 24-hour sulfate standard (25 µg/m3) was not exceeded in any of the monitoring locations in the district. No sulfate data were obtained at SSAB and Orange County stations in 2010. Historical sulfate data showed sulfate concentrations in the SSAB and Orange County areas to be well below the standard; thus, measurements in these areas have been discontinued. There are no federal sulfate standards.

3.2.1.2.8 Vinyl Chloride

Vinyl chloride is a colorless, flammable gas at ambient temperature and pressure. It is also highly toxic and is classified by the American Conference of Governmental Industrial Hygienists (ACGIH) as A1 (confirmed carcinogen in humans) and by the International Agency for Research on Cancer (IARC) as 1 (known to be a human carcinogen)(Air Gas, 2010). At room temperature, vinyl chloride is a gas with a sickly sweet odor that is easily condensed. However, it is stored as a liquid. Due to the hazardous nature of vinyl chloride to human health there are no end products that use vinyl chloride in its monomer form. Vinyl chloride is a chemical intermediate, not a final product. It is an important industrial chemical chiefly used to produce polymer polyvinyl chloride (PVC). The process involves vinyl chloride liquid fed to polymerization reactors where it is converted from a monomer to a polymer PVC. The final product of the polymerization process is PVC in either a flake or pellet form. Billions of pounds of PVC are sold on the global market each year. From its flake or pellet form, PVC is sold to companies that heat and mold the PVC into end products such as PVC pipe and bottles.

In the past, vinyl chloride emissions have been associated primarily with sources such as landfills. Risks from exposure to vinyl chloride are considered to be a localized impacts rather than regional impacts. Because landfills in the district are subject to SCAQMD 1150.1, which contains stringent requirements for landfill gas collection and control, potential vinyl chloride emissions are below the level of detection. Therefore, the SCAQMD does not monitor for vinyl chloride at its monitoring stations.

3.2.1.2.9 Volatile Organic Compounds

It should be noted that there are no state or national ambient air quality standards for VOCs because they are not classified as criteria pollutants. VOCs are regulated, however, because limiting VOC emissions reduces the rate of photochemical reactions that contribute to the formation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, contributing to higher PM10 and lower visibility levels.

Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations of VOCs because of interference with oxygen uptake. In general, ambient VOC concentrations in the atmosphere are suspected to cause coughing, sneezing, headaches, weakness, laryngitis, and bronchitis, even at low concentrations. Some hydrocarbon components classified as VOC emissions are thought or known to be hazardous. Benzene, for example, one hydrocarbon component of VOC emissions, is known to be a human carcinogen.

3.2.1.2.10 Visibility

In 2005, annual average visibility at Rudiboux (Riverside), the worst case, was just over 10 miles (SCAQMD, 2007). With the exception of Lake County, which is designated in attainment, all of the air districts in California are currently designated as unclassified with respect to the CAAQS for visibility reducing particles.

In Class-I wilderness areas, which typically have visual range measured in tens of miles the deciview metric is used to estimate an individual's perception of visibility. The deciview index works inversely to visual range which is measured in miles or kilometers whereby a lower deciview is optimal. In the South Coast Air Basin, the Class-I areas are typically restricted to higher elevations (greater than 6,000 feet above sea level) or far downwind of the metropolitan emission source areas. Visibility in these areas is typically unrestricted due to regional haze despite being in close proximity to the urban setting. The 2005 baseline deciview mapping of the Basin is presented in Figure 3.2-5. All of the Class-I wilderness areas reside in areas having average deciview values less than 20 with many portions of those areas having average deciview values less than 10. By contrast, Rubidoux, in the Basin has a deciview value exceeding 30.

3.2.1.2.10.1 Federal Regional Haze Rule

The federal Regional Haze Rule, established by the U.S. EPA pursuant to CAA section 169A, establishes the national goal to prevent future and remedy existing impairment of visibility in federal Class I areas (such as federal wilderness areas and national parks). U.S. EPA's visibility regulations (40 CFR 51.300 through 51.309), require states to develop measures necessary to make reasonable progress towards remedying visibility impairment in these federal Class I areas. Section 169A and these regulations also require Best Available Retrofit Technology for certain large stationary sources that were put in place between 1962 and 1977. See Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations, 70 Fed. Reg. 39104 (July 6, 2005).

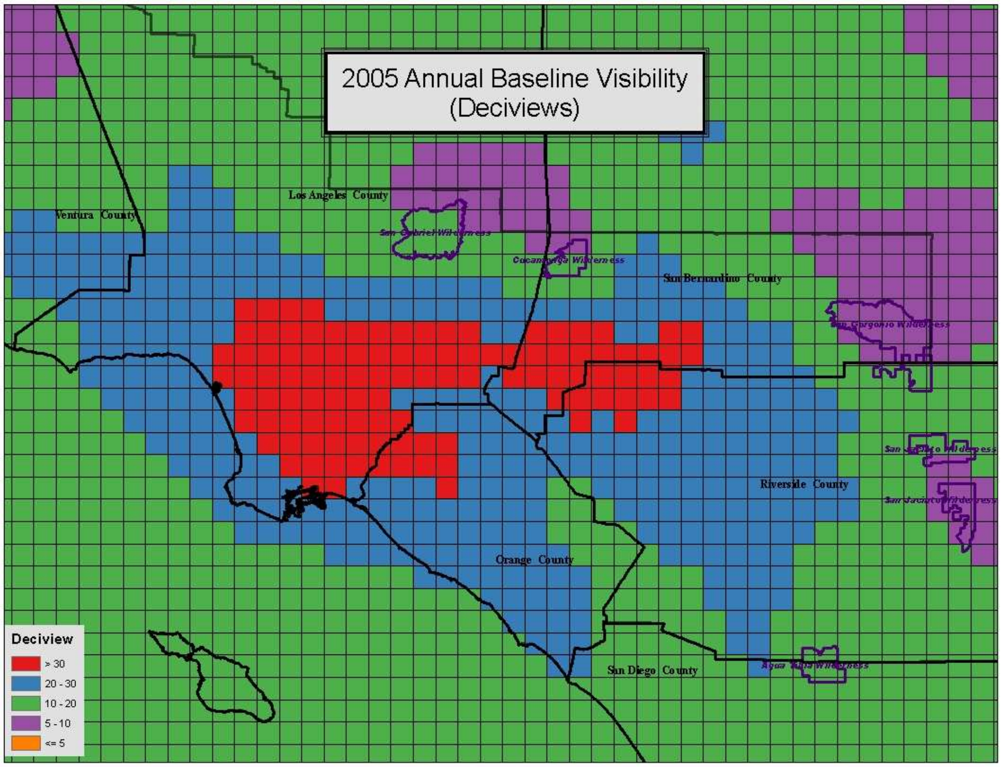


FIGURE 3.2-5

2005 Annual Baseline Visibility

3.2.1.2.10.2 California Air Resources Board

Since deterioration of visibility is one of the most obvious manifestations of air pollution and plays a major role in the public's perception of air quality, the state of California has adopted a standard for visibility or visual range. Until 1989, the standard was based on visibility estimates made by human observers. The standard was changed to require measurement of visual range using instruments that measure light scattering and absorption by suspended particles.

The visibility standard is based on the distance that atmospheric conditions allow a person to see at a given time and location. Visibility reduction from air pollution is often due to the presence of sulfur and nitrogen oxides, as well as particulate matter. Visibility degradation occurs when visibility reducing particles are produced in sufficient amounts such that the extinction coefficient is greater than 0.23 inverse kilometers (to reduce the visual range to less than 10 miles) at relative humidity less than 70 percent, 8-hour average (from 10:00 a.m. to 6:00 p.m.) according to the state standard. Future-year visibility in the Basin is projected empirically using the results derived from a regression analysis of visibility with air quality measurements. The regression data set consisted of aerosol composition data collected during a special monitoring program conducted concurrently with visibility data collection (prevailing visibility observations from airports and visibility measurements from district monitoring stations). A full description of the visibility analysis is given in Appendix V of the 2012 AQMP.

With future year reductions of PM2.5 from implementation of all proposed emission controls for 2015, the annual average visibility would improve from 10 miles (calculated for 2008) to over 20 miles at Rubidoux, for example. Visual range in 2021 at all other Basin sites is expected to equal or exceed the Rubidoux visual range. Visual range is expected to double from the 2008 baseline due to reductions of secondary PM2.5, directly emitted PM2.5 (including diesel soot) and lower nitrogen dioxide concentrations as a result of 2007 AQMP controls.

To meet Federal Regional Haze Rule requirements, ~~the~~ CARB ~~California Air Resources Board~~ adopted the California Regional Haze Plan on January 22, 2009, addressing California's visibility goals through 2018. As stated in Table 3.3-12 above, ~~the~~ California's statewide standard (applicable outside of the Lake Tahoe area) for Visibility Reducing Particles is an extinction coefficient of 0.23 per kilometer over an 8-hour averaging period. This translates to visibility of ten miles or more due to particles when relative humidity is less than 70 percent.

3.2.2 Non-Criteria Pollutants

Although the SCAQMD's primary mandate is attaining the State and National Ambient Air Quality Standards for criteria pollutants within the district, SCAQMD also has a general responsibility pursuant to HSC §41700 to control emissions of air contaminants and prevent endangerment to public health. Additionally, state law requires the SCAQMD to implement airborne toxic control measures (ATCM) adopted by CARB, and to implement the Air Toxics "Hot Spots" Act. As a result, the SCAQMD has regulated pollutants other than criteria pollutants such as TACs, greenhouse gases and stratospheric ozone depleting compounds. The SCAQMD has developed a number of rules to control non-criteria pollutants from both new and existing sources. These rules originated through state directives, CAA requirements, or the SCAQMD rulemaking process.

In addition to promulgating non-criteria pollutant rules, the SCAQMD has been evaluating AQMP control measures as well as existing rules to determine whether or not they would affect, either positively or negatively, emissions of non-criteria pollutants. For example, rules in which VOC components of coating materials are replaced by a non-photochemically reactive chlorinated substance would reduce the impacts resulting from ozone formation, but could increase emissions of toxic compounds or other substances that may have adverse impacts on human health.

The following subsections summarize the existing setting for the two major categories of non-criteria pollutants: compounds that contribute to TACs global climate change, and stratospheric ozone depletion.

3.2.2.1 Air Quality – Toxic Air Contaminants

3.2.2.1.1 Federal

Under Section 112 of the CAA, U.S. EPA is required to regulate sources that emit one or more of the 187 federally listed hazardous air pollutants (HAPs). HAPs are air toxic pollutants identified in the CAA, which are known or suspected of causing cancer or other serious health effects. The federal HAPs are listed on the U.S. EPA website at http://www.epa.gov/ttn/atw/orig189.html. In order to implement the CAA, approximately 100 National Emission Standards for Hazardous Air Pollutants (NESHAPs) have been promulgated by U.S. EPA for major sources (sources emitting greater than 10 tons per year of a single HAP or greater than 25 tons per year of multiple HAPs). The SCAQMD can either directly implement NESHAPs or adopt rules that contain requirements at least as stringent as the NESHAP requirements. However, since NESHAPs often apply to sources in the district that are controlled, many of the sources that would have been subject to federal requirements already comply or are exempt.

In addition to the major source NESHAPs, U.S. EPA has also controlled HAPs from urban areas by developing Area Source NESHAPs under their Urban Air Toxics Strategy. U.S. EPA defines an area source as a source that emits less than 10 tons annually of any single hazardous air pollutant or less than 25 tons annually of a combination of hazardous air pollutants. The CAA requires the U.S. EPA to identify a list of at least 30 air toxics that pose the greatest potential health threat in urban areas. U.S. EPA is further required to identify and establish a list of area source categories that represent 90 percent of the emissions of the 30 urban air toxics associated with area sources, for which Area Source NESHAPs are to be developed under the CAA. U.S. EPA has identified a total of 70 area source categories with regulations promulgated for more than 30 categories so far. ~~Appendix A lists key NESHAPs recently adopted or amended by U.S. EPA.~~

The federal toxics program recognizes diesel engine exhaust as a health hazard, however, diesel particulate matter itself is not one of their listed toxic air contaminants. Rather, each toxic compound in the speciated list of compounds in exhaust is considered separately. Although there are no specific NESHAP regulations for diesel PM, diesel particulate emission reductions are realized through federal regulations including diesel fuel standards and emission standards for stationary, marine, and locomotive engines; and idling controls for locomotives.

3.2.2.1.2 State

The California air toxics program was based on the CAA and the original federal list of hazardous air pollutants. The state program was established in 1983 under the Toxic Air Contaminant Identification and Control Act, Assembly Bill (AB) 1807, Tanner. Under the state program, toxic air contaminants are identified through a two-step process of risk identification and risk management. This two-step process was designed to protect residents from the health effects of toxic substances in the air.

3.2.2.1.2.1 Control of TACs under the TAC Identification and Control Program

California's TAC identification and control program, adopted in 1983 as AB 1807, is a two-step program in which substances are identified as TACs, and ATCMs are adopted to control emissions from specific sources. CARB has adopted a regulation designating all 188 federal hazardous air pollutants (HAPs) as TACs.

ATCMs are developed by CARB and implemented by the SCAQMD and other air districts through the adoption of regulations of equal or greater stringency. Generally, the ATCMs reduce emissions to achieve exposure levels below a determined health threshold. If no such threshold levels are determined, emissions are reduced to the lowest level achievable through the best available control technology unless it is determined that an alternative level of emission reduction is adequate to protect public health.

Under California law, a federal NESHAP automatically becomes a state ATCM, unless CARB has already adopted an ATCM for the source category. Once a NESHAP becomes an ATCM, CARB and each air pollution control or air quality management district have certain responsibilities related to adoption or implementation and enforcement of the NESHAP/ATCM.

3.2.2.1.2.2 Control of TACs under the Air Toxics "Hot Spots" Act

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) establishes a state-wide program to inventory and assess the risks from facilities that emit TACs and to notify the public about significant health risks associated with the emissions. Facilities are phased into the AB 2588 program based on their emissions of criteria pollutants or their occurrence on lists of toxic emitters compiled by the SCAQMD. Phase I consists of facilities that emit over 25 tons per year of any criteria pollutant and facilities present on the SCAQMD's toxics list. Phase I facilities entered the program by reporting their air TAC emissions for calendar year 1989. Phase II consists of facilities that emit between 10 and 25 tons per year of any criteria pollutant, and submitted air toxic inventory reports for calendar year 1990 emissions. Phase III consists of certain designated types of facilities which emit less than 10 tons per year of any criteria pollutant, and submitted inventory reports for calendar year 1991 emissions. Inventory reports are required to be updated every four years under the state law.

3.2.2.1.2.3 Air Toxics Control Measures

As part of its risk management efforts, CARB has passed state ATCMs to address air toxics from mobile and stationary sources. Some key ATCMs for stationary sources include reductions of benzene emissions from service stations, hexavalent chromium emissions from chrome plating, perchloroethylene emissions from dry cleaning, ethylene oxide emissions from sterilizers, and multiple air toxics from the automotive painting and repair industries.

Many of CARB's recent ATCMs are part of the CARB Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (DRRP) which was adopted in September 2000 (http://www.arb.ca.gov/diesel/documents/rrpapp.htm) with the goal of reducing diesel particulate matter emissions from compression ignition engines and associated health risk by 75 percent by 2010 and 85 percent by 2020. The DRRP includes strategies to reduce emissions from new and existing engines through the use of ultra-low sulfur diesel fuel, add-on controls, and engine replacement. In addition to stationary source engines, the plan addresses diesel PM emissions from mobile sources such as trucks, buses, construction equipment, locomotives, and ships. ~~Appendix A lists key ATCMs recently adopted or amended by CARB.~~

3.2.2.1.3 SCAQMD

SCAQMD has regulated criteria air pollutants using either a technology-based or an emissions limit approach. The technology-based approach defines specific control technologies that may be installed to reduce pollutant emissions. The emission limit approach establishes an emission limit, and allows industry to use any emission control equipment, as long as the emission requirements are met. The regulation of TACs often uses a health risk-based approach, but may also require a regulatory approach similar to criteria pollutants, as explained in the following subsections.

3.2.2.1.3.1 Rules and Regulations

Under the SCAQMD's toxic regulatory program there are 15 source-specific rules that target toxic emission reductions that regulate over 10,000 sources such as metal finishing, spraying operations, dry cleaners, film cleaning, gasoline dispensing, and diesel-fueled stationary engines to name a few. In addition, other source-specific rules targeting criteria pollutant reductions also reduce toxic emissions, such as Rule 461 which reduces benzene emissions from gasoline dispensing and Rule 1124 which reduces perchloroethylene, trichloroethylene, and methylene chloride emissions from aerospace operations.

New and modified sources of toxic air contaminants in the district are subject to Rule 1401 - New Source Review of Toxic Air Contaminants and Rule 212 - Standards for Approving Permits. Rule 212 requires notification of the SCAQMD's intent to grant a permit to construct a significant project, defined as a new or modified permit unit located within 1000 feet of a school (a state law requirement under AB 3205), a new or modified permit unit posing an maximum individual cancer risk of one in one million (1×10^{-6}) or greater, or a new or modified facility with criteria pollutant emissions exceeding specified daily maximums. Distribution of notice is required to all addresses within a 1/4-mile radius, or other area deemed appropriate by the SCAQMD. Rule 1401 currently controls emissions of carcinogenic and non-carcinogenic (health effects other than cancer) air contaminants from new, modified and relocated sources by specifying limits on cancer risk and hazard index (explained further in the following discussion), respectively. The rule lists nearly 300 TACs that are evaluated during the SCAQMD's permitting process for new, modified or relocated sources. During the past decade, more than 80 compounds have been added or had risk values amended. The addition of diesel particulate matter from diesel-fueled internal combustion engines as a TAC in March 2008 was the most significant of recent amendments to the rule. Rule 1401.1 sets risk thresholds for new and relocated facilities near schools. The requirements are more stringent than those for other air toxics rules in order to provide additional protection to school children.

3.2.2.1.3.2 Air Toxics Control Plan

In March 2000, the SCAQMD Governing Board approved the Air Toxics Control Plan (ATCP) which was the first comprehensive plan in the nation to guide future toxic rulemaking and programs. The ATCP was developed to lay out the SCAQMD's air toxics control program which built upon existing federal, state, and local toxic control programs as well as co-benefits from implementation of State Implementation Plan (SIP) measures. The concept for the plan was an outgrowth of the Environmental Justice principles and the Environmental Justice Initiatives adopted by the SCAQMD Governing Board in October 1997. Monitoring studies and air toxics regulations that were created from these initiatives emphasized the need for a more systematic approach to reducing toxic air contaminants. The intent of the plan was to reduce exposure to air toxics in an equitable and cost-effective manner that promotes clean, healthful air in the district. The plan proposed control strategies to reduce toxic air contaminants in the district implemented between years 2000 and 2010 through cooperative efforts of the SCAQMD, local governments, CARB and U.S. EPA.

3.2.2.1.3.3 2003 Cumulative Impact Reduction Strategies

The SCAQMD Governing Board approved a cumulative impacts reduction strategy in September 2003. The resulting 25 cumulative impacts strategies were a key element of the 2004 Addendum to the ATCP. The strategies included rules, policies, funding, education, and cooperation with other agencies. Some of the key SCAQMD accomplishments related to the cumulative impacts reduction strategies were:

- Rule 1401.1 which set more stringent health risk requirements for new and relocated facilities near schools
- Rule 1470 which established diesel PM emission limits and other requirements for diesel-fueled engines
- Rule 1469.1 which regulated chrome spraying operations
- Rule 410 which addresses odors from transfer stations and material recovery facilities
- Intergovernmental Review comment letters for CEQA documents
- SCAQMD's land use guidance document
- Additional protection in toxics rules for sensitive receptors, such as more stringent requirements for chrome plating operations and diesel engines located near schools

3.2.2.1.3.4 Addendum to the ATCP

The Addendum to the ATCP (Addendum) was adopted by the SCAQMD Governing Board in 2004 and served as a status report regarding implementation of the various mobile and stationary source strategies in the 2000 ATCP and introduced new measures to further address air toxics. The main elements of the Addendum were to address the progress made in implementation of the 2000 ATCP control strategies provide a historical perspective of air toxic emissions and current air toxic levels; incorporate the Cumulative Impact Reduction Strategies approved by the SCAQMD Governing Board in 2003 and additional measures identified in the 2003 AQMP; project future air toxic levels to the extent feasible; and summarize future efforts to develop the next ATCP. Significant progress had been made in implementing most of the SCAQMD strategies from the 2000 ATCP and the 2004 Addendum. CARB has also made notable progress in mobile source measures via its Diesel Risk Reduction Plan, especially for goods movement related sources, while the U.S. EPA continued to implement their air toxic programs applicable to stationary sources

3.2.2.1.3.5 Clean Communities Plan

On November 5, 2010, the SCAQMD Governing Board approved the 2010 Clean Communities Plan (CCP). The CCP was an update to the 2000 Air Toxics Control Plan (ATCP) and the 2004 Addendum. The objective of the 2010 CCP is to reduce the exposure to air toxics and air-related nuisances throughout the district, with emphasis on cumulative impacts. The elements of the 2010 CCP are community exposure reduction, community participation, communication and outreach, agency coordination, monitoring and compliance, source-specific programs, and nuisance. The centerpiece of the 2010 CCP is a pilot study through which the SCAQMD staff will work with community stakeholders to identify and develop solutions community-specific to air quality issues in two communities: (1) the City of San Bernardino; and, (2) Boyle Heights and surrounding areas.

3.2.2.1.3.6 Control of TACs under the Air Toxics "Hot Spots" Act

In October 1992, the SCAQMD Governing Board adopted public notification procedures for Phase I and II facilities. These procedures specify that AB 2588 facilities must provide public notice when exceeding the following risk levels:

- Maximum Individual Cancer Risk: greater than 10 in one million (10×10^{-6})
- Total Hazard Index: greater than 1.0 for TACs except lead, or > 0.5 for lead

Public notice is to be provided by letters mailed to all addresses and all parents of children attending school in the impacted area. In addition, facilities must hold a public meeting and provide copies of the facility risk assessment in all school libraries and a public library in the impacted area.

The AB2588 Toxics "Hot Spots" Program is implemented through Rule 1402. The SCAQMD continues to review health risk assessments submitted. Notification is required from facilities with a significant risk under the AB 2588 program based on their initial approved health risk assessments and will continue on an ongoing basis as additional and subsequent health risk assessments are reviewed and approved.

There are currently about 600 facilities in the SCAQMD's AB2588 program. Since 1992 when the state Health and Safety Code incorporated a risk reduction requirement in the program, the SCAQMD has reviewed and approved over 300 HRAs, 44 facilities were required to do a public notice, and 21 facilities were subject to risk reduction. Currently, over 96 percent of the facilities in the program have cancer risks below ten in a million and over 98 percent have acute and chronic hazard indices of less than one.

3.2.2.1.3.7 CEQA Intergovernmental Review Program

The SCAQMD staff, through its Intergovernmental Review (IGR) provides comments to lead agencies on air quality analyses and mitigation measures in CEQA documents. The following are some key programs and tools that have been developed more recently to strengthen air quality analyses, specifically as they relate to exposure of mobile source air toxics:

- SCAQMD's Mobile Source Committee approved the "Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Emissions" (August 2002). This document provides guidance for analyzing cancer risks from diesel particulate matter from truck idling and movement (e.g., truck stops, warehouse and distribution centers, or transit centers), ship hotelling at ports, and train idling.

- Cal/EPA and CARB's "Air Quality and Land Use Handbook: A Community Health Perspective" (April 2005), provides recommended siting distances for incompatible land uses.

- Western Riverside Council of Governments Air Quality Task Force developed a policy document titled, "Good Neighbor Guidelines for Siting New and/or Modified Warehouse/Distribution Facilities" (September 2005). This document provides guidance to local government on preventive measures to reduce neighborhood exposure to toxic air contaminants from warehousing facilities.

3.2.2.1.3.8 Environmental Justice (EJ)

Environmental justice has long been a focus of the SCAQMD. In 1990, the SCAQMD formed an Ethnic Community Advisory Group that was recently restructured as the Environmental Justice Advisory Group (EJAG). EJAG's mission is to advise and assist SCAQMD in protecting and improving public health in SCAQMD's most impacted communities through the reduction and prevention of air pollution.

In 1997, the SCAQMD Governing Board adopted four guiding principles and ten initiatives (http://www.aqmd.gov/ej/history.htm) to ensure environmental equity. Also i~~I~~n 1997, the SCAQMD Governing Board expanded the initiatives to include the "Children's Air Quality Agenda" focusing on the disproportionate impacts of poor air quality on children. Some key initiatives that have been implemented were the Multiple Air Toxics Exposure Studies (MATES, MATES II and MATES III); the Clean Fleet Rules, the Cumulative Impacts strategies; funding for lower emitting technologies under the Carl Moyer Program; the Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning; a guidance document on Air Quality Issues in School Site Selection; and the 2000 Air Toxics Control Plan and its 2004 Addendum. Key initiatives focusing on communities and residents include the Clean Air Congress; the Clean School Bus Program; Asthma and Air Quality Consortium; Brain and Lung Tumor and Air Pollution Foundation; air quality presentations to schools and community and civic groups; and Town Hall meetings. Technological and scientific projects and programs have been a large part of the SCAQMD's EJ program since its inception. Over time, the EJ program's focus on public education, outreach, and opportunities for public participation have greatly increased. Public education materials and other resources for the public are available on the SCAQMD's website (www.AQMD.gov)

3.2.2.1.3.9 AB 2766 Subvention Funds

AB2766 subvention funds, money collected by the state as part of vehicle registration and passed through to the SCAQMD, is used to fund projects of local cities that reduce motor vehicle air pollutants. The Clean Fuels Program, funded by a surcharge on motor vehicle registrations in the SCAQMD, reduces TAC emissions through co-funding projects to develop and demonstrate low-emission clean fuels and advanced technologies, and to promote commercialization and deployment of promising or proven technologies in Southern California.

3.2.2.1.3.10 Carl Moyer Program

Another program that targets diesel emission reductions is the Carl Moyer program which provides grants for projects that achieve early or extra emission reductions beyond what is required by regulations. Examples of eligible projects include cleaner on-road, off-road, marine, locomotive, and stationary agricultural pump engines. Other endeavors of the SCAQMD's Technology Advancement Office help to reduce diesel PM emissions through co-funding research and demonstration projects of clean technologies, such as low-emitting locomotives.

3.2.2.1.3.11 Control of TACs with Risk Reduction Audits and Plans

Senate Bill (SB) 1731, enacted in 1992 and codified at HSC §44390 et seq., amended AB 2588 to include a requirement for facilities with significant risks to prepare and implement a risk reduction plan which will reduce the risk below a defined significant risk level within specified time limits. SCAQMD Rule 1402 - Control of Toxic Air Contaminants From Existing Sources, was adopted on April 8, 1994, to implement the requirements of SB 1731.

In addition to the TAC rules adopted by SCAQMD under authority of AB 1807 and SB 1731, the SCAQMD has adopted source-specific TAC rules, based on the specific level of TAC emitted and the needs of the area. These rules are similar to the state's ATCMs because they are source-specific and only address emissions and risk from specific compounds and operations.

3.2.2.1.3.12 Multiple Air Toxics Exposure Studies

<u>*Multiple Air Toxics Exposure Study (MATES)*</u>

In 1986, SCAQMD conducted the first MATES Study to determine the Basin-wide risks associated with major airborne carcinogens. At the time, the state of technology was such that only twenty known air toxic compounds could be analyzed and diesel exhaust particulate did not have an agency accepted carcinogenic health risk value. Toxic air contaminants are determined by the U.S. EPA, and by the Cal/EPA, including the Office of Environmental Health Hazard Assessment and the ARB. For purposes of MATES, the California carcinogenic health risk factors were used. The maximum combined individual health risk for simultaneous exposure to pollutants under the study was estimated to be 600 to 5,000 in one million.

Multiple Air Toxics Exposure Study II (MATES II)

At its October 10, 1997 meeting, the SCAQMD Governing Board directed staff to conduct a follow up to the MATES study to quantify the magnitude of population exposure risk from existing sources of selected air toxic contaminants at that time. The follow up study, MATES II, included a monitoring program of 40 known air toxic compounds, an updated emissions inventory of toxic air contaminants (including microinventories around each of the 14 microscale sites), and a modeling effort to characterize health risks from hazardous air pollutants. The estimated basin-wide carcinogenic health risk from ambient measurements was 1,400 per million people. About 70 percent of the basin wide health risk was attributed to diesel particulate emissions; about 20 percent to other toxics associated with mobile sources (including benzene, butadiene, and formaldehyde); about 10 percent of basin wide health risk was attributed to stationary sources (which include industrial sources and other certain specifically identified commercial businesses such as dry cleaners and print shops.)

Multiple Air Toxics Exposure Study III (MATES III)

MATES III was a follow up to previous air toxics studies in the Basin and was part of the SCAQMD Governing Board's 2003-04 Environmental Justice Workplan. The MATES III Study consists of several elements including a monitoring program, an updated emissions inventory of toxic air contaminants, and a modeling effort to characterize carcinogenic health risk across the Basin. Besides toxics, additional measurements include organic carbon, elemental carbon, and total carbon, as well as, Particulate Matter (PM), including PM2.5. It did not estimate mortality or other health effects from particulate exposures. MATES III revealed a general downward trend in air toxic pollutant concentrations with an estimated basin-wide lifetime carcinogenic health risk of 1,200 in one million. Mobile sources accounted for 94 percent of the basin-wide lifetime carcinogenic health risk with diesel exhaust particulate contributing to 84 percent of the mobile source basin-wide lifetime carcinogenic health risk. Non-diesel carcinogenic health risk was reduced declined by 50 percent from the MATES II values.

3.2.2.2.4 Health Effects

3.2.2.2.4.1 Carcinogenic Health Risks from Toxic Air Contaminants

One of the primary health risks of concern due to exposure to TACs is the risk of contracting cancer. The carcinogenic potential of TACs is a particular public health concern because it is currently believed by many scientists that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of causing cancer. It is currently estimated that about one in four deaths in the United States is attributable to cancer. About two percent of cancer deaths in the United States may be attributable to environmental pollution (Doll and Peto 1981). The proportion of cancer deaths attributable to air pollution has not been estimated using epidemiological methods.

3.2.2.2.4.2 Non-Cancer Health Risks from Toxic Air Contaminants

Unlike carcinogens, for most TAC non-carcinogens it is believed that there is a threshold level of exposure to the compound below which it will not pose a health risk. Cal/EPA's Office of Environmental Health Hazard Assessment (OEHHA) develops Reference Exposure Levels (RELs) for TACs which are health-conservative estimates of the levels of exposure at or below which health effects are not expected. The non-cancer health risk due to exposure to a TAC is assessed by comparing the estimated level of exposure to the REL. The comparison is expressed as the ratio of the estimated exposure level to the REL, called the hazard index (HI).

3.2.2.2 Climate Change

Global climate change is a change in the average weather of the earth, which can be measured by wind patterns, storms, precipitation, and temperature. Historical records have shown that temperature changes have occurred in the past, such as during previous ice ages. Data indicate that the current temperature record differs from previous climate changes in rate and magnitude.

Gases that trap heat in the atmosphere are often called greenhouse gases (GHGs), comparable to a greenhouse, which captures and traps radiant energy. GHGs are emitted by natural processes and human activities. The accumulation of greenhouse gases in the atmosphere regulates the earth's temperature. Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of GHGs in the atmosphere. The six major GHGs are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs), and perfluorocarbon (PFCs). The GHGs absorb longwave radiant energy emitted by the Earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the Earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect." Emissions from human activities such as fossil fuel combustion for electricity production and vehicles have elevated the concentration of these gases in the atmosphere.

CO2 is an odorless, colorless greenhouse gas. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic (human caused) sources of CO2 are from burning coal, oil, natural gas, and wood.

CH4 is a flammable gas and is the main component of natural gas. N2O, also known as laughing gas, is a colorless greenhouse gas. Some industrial processes such as fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions also contribute to the atmospheric load of N2O. HFCs are synthetic man-made chemicals that are used as a substitute for chlorofluorocarbons (whose production was stopped as required by the Montreal Protocol) for automobile air conditioners and refrigerants. The two main sources of PFCs are primary aluminum production and semiconductor manufacture. SF6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

Scientific consensus, as reflected in recent reports issued by the United Nations Intergovernmental Panel on Climate Change, is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHGs in the atmosphere due to human activities. Industrial activities, particularly increased consumption of fossil fuels (e.g., gasoline, diesel, wood, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHGs. The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of greenhouse gases needed to stabilize global temperatures and climate change impacts. It concluded that a stabilization of greenhouse gases at 400 to 450 ppm carbon dioxide-equivalent concentration is required to keep global mean warming below two degrees Celsius, which is assumed to be necessary to avoid dangerous impacts from climate change.

The potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, air quality impacts, and sea level rise. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases may increase, such as those spread by mosquitoes and other disease carrying insects. Those diseases include malaria, dengue fever, yellow fever, and encephalitis. Extreme events such as flooding, hurricanes, and wildfires can displace people and agriculture, which would have negative consequences. Drought in some areas may increase, which would decrease water and food availability. Global warming may also contribute to air quality problems from increased frequency of smog and particulate air pollution.

The impacts of climate change will also affect projects in various ways. Effects of climate change are rising sea levels and changes in snow pack. The extent of climate change impacts at specific locations remains unclear. It is expected that Federal, State and local agencies will more precisely quantify impacts in various regions. As an example, it is expected that the California Department of Water Resources will formalize a list of foreseeable water quality issues associated with various degrees of climate change. Once state government agencies make these lists available, they could be used to more precisely determine to what extent a project creates global climate change impacts.

3.2.2.2.1 Federal

3.2.2.2.1.1 Greenhouse Gas Endangerment Findings

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the CAA (). The Endangerment Finding stated that CO2, CH4, N2O, HFCs, PFCs, and SF6 taken in combination endanger both the public health and the public welfare of current and future generations. The Cause or Contribute Finding stated that the combined emissions from motor vehicles and motor vehicle engines contribute to the greenhouse gas air pollution that endangers public health and welfare. These findings were a prerequisite for implementing GHG standards for vehicles. The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) finalized emission standards for light-duty vehicles in May 2010 and for heavy-duty vehicles in August of 2011.

3.2.2.2.1.2 Renewable Fuel Standard

The RFS program was established under the Energy Policy Act (EPAct) of 2005, and required 7.5 billion gallons of renewable-fuel to be blended into gasoline by 2012. Under the Energy Independence and Security Act (EISA) of 2007, the RFS program was expanded to include diesel, required the volume of renewable fuel blended into transportation fuel be increased from nine billion gallons in 2008 to 36 billion gallons by 2022, established new categories of renewable fuel and required U.S. EPA to apply lifecycle GHG performance threshold standards so that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces. The RFS is expected to reduce greenhouse gas emissions by 138 million metric tons, about the annual emissions of 27 million passenger vehicles, replacing about seven percent of expected annual diesel consumption and decreasing oil imports by $41.5 billion.

3.2.2.2.1.3 GHG Tailoring Rule

On May 13, 2010, U.S. EPA finalized the Tailoring Rule to phase in the applicability of the PSD and Title V operating permit programs for GHGs. The rule was tailored to include the largest GHG emitters, while excluding smaller sources (restaurants, commercial facilities and small farms). The first step (January 2, 2011 to June 30, 2011) addressed the largest sources that contributed 65 percent of the stationary GHG sources. Title V GHG requirements were triggered only when affected facility owners/operators were applying, renewing or revising their permits for non-GHG pollutants. PSD GHG requirements were applicable only if sources were undergoing permitting actions for other non-GHG pollutants and the permitted action would increase GHG emission by 75,000 metric tons of CO2e per year or more.

The second step (July 1, 2011 to June 30, 2013), included sources that emit or have the potential to emit 100,000 of CO2e metric tons per year or more. Newly constructed sources that are not major sources for non-GHG pollutants would not be subject to PSD GHG requirements unless it emits 100,000 tons of CO2e per year or more. Modifications to a major source would not be subject to PSD GHG requirements unless it generates a net increase of 75,000 tons of CO2e per year or more. Sources not subject to Title V would not be subject to Title V GHG requirements unless 100,000 tons of CO2e per year or more would be emitted.

The third step of the Tailoring Rule was finalized on July 12, 2012. The third step determined not to not to lower the current PSD and Title V applicability thresholds for GHG-emitting sources established in the Tailoring Rule for Steps 1 and 2. The rule also promulgates regulatory revisions for better implementation of the federal program for establishing plantwide applicability limitations (PALs) for GHG emissions, which will improve the administration of the GHG PSD permitting programs.

3.2.2.2.1.4 GHG Reporting Program

U.S. EPA issued the Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98) under the 2008 Consolidated Appropriations Act. The Mandatory Reporting of Greenhouse Gases Rule requires reporting of GHG data from large sources and suppliers under the Greenhouse Gas Reporting Program (GHGRP). Suppliers of certain products that would result in GHG emissions if released, combusted or oxidized; direct emitting source categories; and facilities that inject CO_2 underground for geologic sequestration or any purpose other than geologic sequestration are included. Facilities that emit 25,000 metric tons or more per year of GHGs in CO2 equivalents (CO2e) are required to submit annual reports to U.S. EPA. For the 2010 calendar, there were 6,260 entities that reported GHG data under this program, and 467 of the entities reporting were from California. Of the 3,200 million metric tons of CO2e that were reported nationally, 112 million metric tons were from California Power plants were the largest stationary source of direct U.S. GHG emissions with 2,326 million metric tons of CO2e, followed by refineries with 183 million metric tons of CO2e. CO2 emissions accounted for largest share of direct emissions with 95 percent, followed by methane with four percent, and nitrous oxide and fluorinated gases representing the remaining one percent.

3.2.2.2.2 State

3.2.2.2.2.1 Executive Order S-3-05

In June 2005, then Governor Schwarzenegger signed Executive Order S-3-05, which established emission reduction targets. The goals would reduce GHG emissions to 2000 levels by 2010, then to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

3.2.2.2.2.2 AB 32: Global Warming Solutions Act

On September 27, 2006, Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, was enacted by the State of California and signed by Governor Schwarzenegger. AB 32 expanded on Executive Order #S-3-05. The legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 represents the first enforceable state-wide program in the United States to cap all GHG emissions from major industries that includes penalties for non-compliance. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce greenhouse gas emissions in California and from power generation facilities located outside the state that serve California residents and businesses.

AB 32 requires CARB to:

- Establish a statewide GHG emissions cap for 2020, based on 1990 emissions by January 1, 2008;
- Adopt mandatory reporting rules for significant sources of GHG by January 1, 2008;
- Adopt an emissions reduction plan by January 1, 2009, indicating how emissions reductions will be achieved via regulations, market mechanisms, and other actions; and
- Adopt regulations to achieve the maximum technologically feasible and cost-effective reductions of GHG by January 1, 2011.

The combination of Executive Order #S-3-05 and AB 32 will require significant development and implementation of energy efficient technologies and shifting of energy production to renewable sources.

Consistent with the requirement to develop an emission reduction plan, CARB prepared a Scoping Plan indicating how GHG emission reductions will be achieved through regulations, market mechanisms, and other actions. The Scoping Plan was released for public review and comment in October 2008 and approved by CARB on December 11, 2008. The Scoping Plan calls for reducing greenhouse gas emissions to 1990 levels by 2020. This means cutting approximately 30 percent from business-as-usual (BAU) emission levels projected for 2020, or about 15 percent from today's levels. Key elements of CARB staff's recommendations for reducing California's greenhouse gas emissions to 1990 levels by 2020 contained in the Scoping Plan include the following:

- Expansion and strengthening of existing energy efficiency programs and building and appliance standards;
- Expansion of the Renewables Portfolio Standard to 33 percent;
- Development of a California cap-and-trade program that links with other Western Climate Initiative (WCI) Partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gases and pursuing policies and incentives to achieve those targets;
- Adoption and implementation of existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Targeted fees, including a public good charge on water use, fees on high GWP gases and a fee to fund the state's long-term commitment to AB 32 administration.

In response to the comments received on the Draft Scoping Plan and at the November 2008 public hearing, CARB made a few changes to the Draft Scoping Plan, primarily to:

- State that California "will transition to 100 percent auction" of allowances and expects to "auction significantly more [allowances] than the Western Climate Initiative minimum;"
- Make clear that allowance set-asides could be used to provide incentives for voluntary renewable power purchases by businesses and individuals and for increased energy efficiency;
- Make clear that allowance set-asides can be used to ensure that voluntary actions, such as renewable power purchases, can be used to reduce greenhouse gas emissions under the cap;
- Provide allowances are not required from carbon neutral projects; and
- Mandate that commercial recycling be implemented to replace virgin raw materials with recyclables.

3.2.2.2.2.3 SB 97 - CEQA: Greenhouse Gas Emissions

On August 24, 2007, Governor Schwarzenegger signed into law Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions stating, "This bill advances a coordinated policy for reducing greenhouse gas emissions by directing the Office of Planning and Research (OPR) and the Resources Agency to develop CEQA guidelines on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions." OPR's amendments provided guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments did not establish a threshold for significance for GHG emissions. The amendments became effective on March 18, 2010. SB 97 was repealed on January 1, 2010.

3.2.2.2.2.4 Office of Planning and Research - Technical Advisory on CEQA and Climate Change

Consistent with SB 97, on June 19, 2008, OPR released its "Technical Advisory on CEQA and Climate Change," which was developed in cooperation with the Resources Agency, the Cal/EPA, and the CARB. According to OPR, the "Technical Advisory" offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions.

According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively considerable" even though its GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

In 2009, total California greenhouse gas emissions were 457 million metric tons of carbon dioxide equivalent (MMTCO2e); net emissions were 453 MMTCO2e, reflecting the influence of sinks (net CO2 flux from forestry). While total emissions have increased by 5.5 percent from 1990 to 2009, emissions decreased by 5.8 percent from 2008 to 2009 (485 to 457 MMTCO2e). The total net emissions between 2000 and 2009 decreased from 459 to 453 MMTCO2e, representing a 1.3 percent decrease from 2000 and a 6.1 percent increase from the 1990 emissions level. The transportation sector accounted for approximately 38 percent of the total emissions, while the industrial sector accounted for approximately 20 percent. Emissions from electricity generation were about 23 percent with almost equal contributions from in-state and imported electricity.

Per capita emissions in California have slightly declined from 2000 to 2009 (by 9.7 percent), but the overall nine percent increase in population during the same period offsets the emission reductions. From a per capita sector perspective, industrial per capita emissions have declined 21 percent from 2000 to 2009, while per capita emissions for ozone depleting substances (ODS) substitutes saw the highest increase (52 percent).

From a broader geographical perspective, the state of California ranked second in the United States for 2007 greenhouse gas emissions, only behind Texas. However, from a per capita standpoint, California had the 46th lowest GHG emissions. On a global scale, California had the 14th largest carbon dioxide emissions and the 19th largest per capita emissions. The GHG inventory is divided into three categories: stationary sources, on-road mobile sources, and off-road mobile sources.

3.2.2.2.2.5 AB 1493 Vehicular Emissions: Carbon Dioxide

Prior to the U.S. EPA and NHTSA joint rulemaking, the Governor signed Assembly Bill (AB) 1493 (2002). AB 1493 requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

CARB originally approved regulations to reduce GHGs from passenger vehicles in September 2004, with the regulations to take effect in 2009. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1). California's first request to the U.S. EPA to implement GHG standards for passenger vehicles was made in December 2005 and denied in March 2008. The U.S. EPA then granted California the authority to implement GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles on June 30, 2009.

On April 1, 2010, the CARB filed amended regulations for passenger vehicles as part of California's commitment toward the National Program to reduce new passenger vehicle

GHGs from 2012 through 2016. The amendments will prepare California to harmonize its rules with the federal Light-Duty Vehicle GHG Standards and CAFE Standards (discussed above).

3.2.2.2.2.6 Senate Bill 1368 (2006)

SB 1368 is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (PUC) to establish a greenhouse gas emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) must establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the PUC and CEC.

3.2.2.2.2.7 Executive Order S-1-07 (2007)

Governor Schwarzenegger signed Executive Order S-1-07 in 2007 which finds that the transportation sector is the main source of GHG emissions in California. The executive order proclaims the transportation sector accounts for over 40 percent of statewide GHG emissions. The executive order also establishes a goal to reduce the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020.

In particular, the executive order established a Low-Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by CEC on December 24, 2007) and was submitted to CARB for consideration as an "early action" item under AB 32. CARB adopted the LCFS on April 23, 2009.

3.2.2.2.2.8 Senate Bill 375 (2008)

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. As part of the alignment, SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS) which prescribes land use allocation in that MPO's Regional Transportation Plan (RTP). CARB, in consultation with MPOs, is required to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned GHG emission reduction targets. If MPOs do not meet the GHG reduction targets, transportation projects located in the MPO boundaries would not be eligible for funding programmed after January 1, 2012.

CARB appointed the Regional Targets Advisory Committee (RTAC), as required under SB 375, on January 23, 2009. The RTAC's charge was to advise ARB on the factors to be considered and methodologies to be used for establishing regional targets. The RTAC provided its recommendation to CARB on September 29, 2009. CARB must adopt final targets by September 30, 2010.

3.2.2.2.2.9 Executive Order S-13-08 (2008)

Governor Schwarzenegger signed Executive Order S-13-08 on November 14, 2008 which directs California to develop methods for adapting to climate change through preparation of a statewide plan. The executive order directs OPR, in cooperation with the Resources Agency, to provide land use planning guidance related to sea level rise and other climate change impacts by May 30, 2009. The order also directs the Resources Agency to develop a state Climate Adaptation Strategy by June 30, 2009 and to convene an independent panel to complete the first California Sea Level Rise Assessment Report. The assessment report is required to be completed by December 1, 2010 and required to meet the following four criteria:

1. Project the relative sea level rise specific to California by taking into account issues such as coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates;
2. Identify the range of uncertainty in selected sea level rise projections;
3. Synthesize existing information on projected sea level rise impacts to state infrastructure (e.g., roads, public facilities, beaches), natural areas, and coastal and marine ecosystems; and
4. Discuss future research needs relating to sea level rise in California.

3.2.2.2.2.10 Senate Bills 1078 and 107 and Executive Order S-14-08 (2008)

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, then Governor Schwarzenegger signed Executive Order S-14-08, which expands the state’s Renewable Portfolio Standard to 33 percent renewable power by 2020.

3.2.2.2.2.11 SB X-1-2

SB X1-2 was signed by Governor Edmund G. Brown, Jr., in April 2011. SB X1-2 created a new Renewables Portfolio Standard (RPS), which preempted the CARB’s 33 percent Renewable Electricity Standard. The new RPS applies to all electricity retailers in the state including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. These entities must adopt the new RPS goals of 20 percent of retails sales from renewables by the end of 2013, 25 percent by the end of 2016, and the 33 percent requirement by the end of 2020.

3.2.2.2.2 SCAQMD

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy commits the SCAQMD to consider global impacts in rulemaking and in drafting revisions to the AQMP. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include support of the adoption of a California greenhouse gas emission reduction goal.

3.2.2.2.2.1 Basin GHG Policy and Inventory

The SCAQMD has established a policy, adopted by the SCAQMD Governing Board at its September 5, 2008 meeting, to actively seek opportunities to reduce emissions of criteria, toxic, and climate change pollutants. The policy includes the intent to assist businesses and local governments implementing climate change measures, decrease the agency's carbon footprint, and provide climate change information to the public. The SCAQMD will take the following actions:

1. Work cooperatively with other agencies/entities to develop quantification protocols, rules, and programs related to greenhouse gases;
2. Share experiences and lessons learned relative to the Regional Clean Air Incentives Market (RECLAIM) to help inform state, multi-state, and federal development of effective, enforceable cap-and-trade programs. To the extent practicable, staff will actively engage in current and future regulatory development to ensure that early actions taken by local businesses to reduce greenhouse gases will be treated fairly and equitably. SCAQMD staff will seek to streamline administrative procedures to the extent feasible to facilitate the implementation of AB 32 measures;
3. Review and comment on proposed legislation related to climate change and greenhouse gases, pursuant to the 'Guiding Principles for SCAQMD Staff Comments on Legislation Relating to Climate Change' approved at the SCAQMD Governing Board's Special Meeting in April 2008;
4. Provide higher priority to funding Technology Advancement Office (TAO) projects or contracts that also reduce greenhouse gas emissions;
5. Develop recommendations through a public process for an interim greenhouse gas CEQA significance threshold, until such time that an applicable and appropriate statewide greenhouse gas significance level is established. Provide guidance on analyzing greenhouse gas emissions and identify mitigation measures. Continue to consider GHG impacts and mitigation in SCAQMD lead agency documents and in comments when SCAQMD is a responsible agency;
6. Revise the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning to include information on greenhouse gas strategies as a resource for local governments. The Guidance Document will be consistent with state guidance, including CARB's Scoping Plan;

7. Update the Basin's greenhouse gas inventory in conjunction with each Air Quality Management Plan. Information and data used will be determined in consultation with CARB, to ensure consistency with state programs. Staff will also assist local governments in developing greenhouse gas inventories;

8. Bring recommendations to the SCAQMD Governing Board on how the agency can reduce its own carbon footprint, including drafting a Green Building Policy with recommendations regarding SCAQMD purchases, building maintenance, and other areas of products and services. Assess employee travel as well as other activities that are not part of a GHG inventory and determine what greenhouse gas emissions these activities represent, how they could be reduced, and what it would cost to offset the emissions;

9. Provide educational materials concerning climate change and available actions to reduce greenhouse gas emissions on the SCAQMD website, in brochures, and other venues to help cities and counties, businesses, households, schools, and others learn about ways to reduce their electricity and water use through conservation or other efforts, improve energy efficiency, reduce vehicle miles traveled, access alternative mobility resources, utilize low emission vehicles and implement other climate friendly strategies; and

10. Conduct conferences, or include topics in other conferences, as appropriate, related to various aspects of climate change, including understanding impacts, technology advancement, public education, and other emerging aspects of climate change science.

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. SCAQMD's recommended interim GHG significance threshold proposal uses a tiered approach to determining significance. Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. Tier 2 consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. Tier 3 establishes a screening significance threshold level to determine significance using a 90 percent emission capture rate approach, which corresponds to 10,000 metric tons of CO2 equivalent emissions per year (MTCO2e/year). Tier 4, to be based on performance standards, is yet to be developed. Under Tier 5 the project proponent would allow offsets to reduce GHG emission impacts to less than the proposed screening level. If CARB adopts statewide significance thresholds, SCAQMD staff plans to report back to the SCAQMD Governing Board regarding any recommended changes or additions to the SCAQMD's interim threshold.

Table 3.2-10 presents the GHG emission inventory by major source categories in calendar year 2008, as identified in the 2012 AQMP, for Basin. The emissions reported herein are based on in-basin energy consumption and do not include out-of-basin energy production (e.g., power plants, crude oil production) or delivery emissions (e.g., natural gas pipeline loss). Three major GHG pollutants have been included: the CO2, N2O, and CH4. These GHG emissions are reported in MMTCO2e. Mobile sources generate 59.4 percent of the

TABLE 3.2-10

2008 GHG Emissions for Basin

		Emission (TPD)			Emission (TPY)			MMTONS
CODE	Source Category	CO2	N2O	CH4	CO2	N2O	CH4	CO2e
	Fuel Combustion							
10	Electric Utilities	34,303	.08	0.71	12,520,562	29.0	258	11.4
20	Cogeneration	872	.00	0.02	318,340	0.60	6.00	0.29
30	Oil and Gas Production (combustion)	2,908	.01	0.08	1,061,470	4.71	29.5	0.96
40	Petroleum Refining (Combustion)	44,654	.06	0.57	16,298,766	20.7	207	14.8
50	Manufacturing and Industrial	22,182	.06	0.48	8,096,396	20.9	174	7.35
52	Food and Agricultural Processing	927	00	0.02	338,516	0.84	7.16	0.31
60	Service and Commercial	21,889	0.08	0.59	7,989,416	30.8	215	7.26
99	Other (Fuel Combustion)	2,241	0.2	0.16	818,057	8.58	58	0.75
Total Fuel Combustion		**129,977**	**0.32**	**2.62**	**47,441,523**	**116**	**956**	**43.1**
	Waste Disposal							
110	Sewage Treatment	26.4	0.00	0.00	9,653	0.12	1.50	0.01
120	Landfills	3,166	0.04	505	1,155,509	14.0	184,451	4.57
130	Incineration	580	0.00	0.02	211,708	0.81	5.48	0.19
199	Other (Waste Disposal)			2.25	0	0.00	820	0.02
Total Waste Disposal		**3,772**	**0.04**	**508**	**1,376,870**	**14.9**	**185,278**	**4.78**
	Cleaning and Surface Coatings							
210	Laundering							
220	Degreasing							
230	Coatings and Related Processes	27.1	0.00	0.21	9,890	0.02	78.0	0.01
240	Printing			0.00	0	0.00	0.00	0.00
250	Adhesives and Sealants			0.00	0	0.00	0.00	0.00
299	Other (Cleaning and Surface Coatings)	2,621	0.00	0.12	956,739	1.20	43.9	0.87
Total Cleaning and Surface Coatings		**2,648**	**0.00**	**0.33**	**966,628**	**1.22**	**122**	**0.88**
	Petroleum Production and Marketing							
310	Oil and Gas Production	92.1	0.00	0.92	33,605	0.06	336	0.04
320	Petroleum Refining	770	0.00	1.65	280,932	0.36	603	0.27
330	Petroleum Marketing			83.8	0	0.00	30,598	0.58
399	Other (Petroleum Production and Marketing)			0.00	0	0.00	0	0.00
Total Petroleum Production and Marketing		**862**	**0.00**	**86.4**	**314,536**	**0.42**	**31,537**	**0.89**

TABLE 3.2-10 (Continued)

2008 GHG Emissions for Basin

		Emission (TPD)			Emission (TPY)			MMTONS
CODE	**Source Category**	**CO2**	**N2O**	**CH4**	**CO2**	**N2O**	**CH4**	**CO2 e**
	Industrial Processes							
410	Chemical			0.92	0	0.00	337	0.01
420	Food and Agriculture			0.02	0	0.00	7.10	0.00
430	Mineral Processes	279	0.00	0.05	101,804	0.19	17.3	0.09
440	Metal Processes			0.02	0	0.00	9.10	0.00
450	Wood and Paper			0.00	0	0.00	0.00	0.00
460	Glass and Related Products			0.00	0	0.00	0.90	0.00
470	Electronics			0.00	0	0.00	0.00	0.00
499	Other (Industrial Processes)	0.08	0.00	0.47	28	0.00	172	0.00
	Total Industrial Processes	**279**	**0.00**	**1.49**	**101,832**	**0.19**	**543**	**0.10**
	Solvent Evaporation							
510	Consumer Products			0.00	0.00	0.00	0.00	0.00
520	Architectural Coatings and Related Solvent			0.00	0.00	0.00	0.00	0.00
530	Pesticides/Fertilizers			0.00	0.00	0.00	0.00	0.00
540	Asphalt Paving/Roofing			0.07	0.00	0.00	24.20	0.00
	Total Solvent Evaporation	**0.00**	**0.00**	**0.07**	**0.00**	**0.00**	**24.20**	**0.00**
	Miscellaneous Processes							
610	Residential Fuel Combustion	38,850	0.12	0.95	14,180,326	45.3	347	12.9
620	Farming Operations			25.6	0.00	0.00	9,354	0.18
630	Construction and Demolition			0.00	0.00	0.00	0	0.00
640	Paved Road Dust			0.00	0.00	0.00	0	0.00
645	Unpaved Road Dust			0.00	0.00	0.00	0	0.00
650	Fugitive Windblown Dust			0.00	0.00	0.00	0	0.00
660	Fires			0.08	0.00	0.00	30.9	0.00
670	Waste Burning and Disposal			0.58	0.00	0.00	212	0.00
680	Utility Equipment				0.00	0.00		0.00
690	Cooking			0.64	0.00	0.00	235	0.00
699	Other (Miscellaneous Processes			0.00	0.00	0.00	0	0.00
	Total Miscellaneous Processes	**38,850**	**0.12**	**27.9**	**14,180,326**	**45.3**	**10,179**	**13.1**

TABLE 3.2-10 (CONCLUDED)

2008 GHG Emissions for Basin

CODE	Source Category	Emission (TPD) CO2	Emission (TPD) N2O	Emission (TPD) CH4	Emission (TPY) CO2	Emission (TPY) N2O	Emission (TPY) CH4	MMTONS CO2e
On-Road Motor Vehicles								
710	Light Duty Passenger Auto (LDA)	84,679	2.72	3.62	30,907,957	993	1,321	28.3
722	Light Duty Trucks 1 (T1 : up to 3750 lb.)	22,319	0.72	0.96	8,146,321	263	350	7.47
723	Light Duty Trucks 2 (T2 : 3751-5750 lb.)	33,495	1.08	1.43	12,225,619	392	523	11.2
724	Medium Duty Trucks (T3 : 5751-8500 lb.)	29,415	0.94	1.25	10,736,309	343	456	9.85
732	Light Heavy Duty Gas Trucks 1 (T4 : 8501-10000 lb.)	8,195	0.16	0.21	2,991,059	57.3	76.7	2.73
733	Light Heavy Duty Gas Trucks 2 (T5 : 10001-14000 lb.)	1,116	0.05	0.07	407,174	19.0	25.6	0.38
734	Medium Heavy Duty Gas Trucks (T6 : 14001-33000 lb.)	727	0.02	0.20	265,506	5.48	73.0	0.24
736	Heavy Heavy Duty Gas Trucks ((HHDGT > 33000 lb.)	102	0.01	0.01	37,198	2.19	2.56	0.03
742	Light Heavy Duty Diesel Trucks 1 (T4 : 8501-10000 lb.)	2,166	0.02	0.02	790,600	6.94	7.30	0.72
743	Light Heavy Duty Diesel Trucks 2 (T5 : 10001-14000 lb.)	735	0.01	0.01	268,413	2.56	2.92	0.24
744	Medium Heavy Duty Diesel Truck (T6 : 14001-33000 lb.)	5,422	0.02	0.02	1,978,974	8.40	8.76	1.80
746	Heavy Heavy Duty Diesel Trucks (HHDDT > 33000 lb.)	17,017	0.05	0.05	6,211,247	17.5	16.4	5.64
750	Motorcycles (MCY)	7,959	0.26	0.34	2,904,910	94.9	124	2.66
760	Diesel Urban Buses (UB)	2,135	0.00	0.00	779,389	1.46	1.46	0.71
762	Gas Urban Buses (UB)	166	0.02	0.02	60,654	8.40	6.94	0.06
770	School Buses (SB)	337	0.00	0.00	122,995	1.46	1.46	0.11
776	Other Buses (OB)	927	0.00	0.00	338,430	0.73	0.73	0.31
780	Motor Homes (MH)	568	0.03	0.04	207,431	11.0	14.6	0.19
Total On-Road Motor Vehicles		**217,480**	**6.11**	**8.26**	**79,380,188**	**155**	**187**	**72.7**
Other Mobile Sources								
810	Aircraft	37,455	0.10	0.09	13,670,930	36.5	31.8	12.4
820	Trains	586	0.00	0.00	213,835	0.45	1.38	0.19
830	Ships and Commercial Boats	3,452	0.01	0.02	1,259,927	2.64	8.13	1.14
	Other Off-road sources (construction equipment, airport equipment, oil and gas drilling equipment)	16,080	1.72	8.84	5,869,123	628	3,226	5.56
Total Other Mobile Sources		**57,572**	**1.83**	**8.95**	**21,013,816**	**668**	**3,268**	**19.3**
Total Stationary and Area Sources		**176,388**	**0.49**	**626**	**64,381,716**	**178**	**228,639**	**63**
Total On-Road Vehicles		**217,480**	**6.11**	**8.26**	**79,380,188**	**155**	**187**	**73**
Total Other Mobile*		**57,572**	**1.83**	**8.95**	**21,013,816**	**668**	**3,268**	**19**
Total 2008 Baseline GHG Emissions for Basin		**451,440**	**8.42**	**644**	**164,775,719**	**1,001**	**232,094**	**155**

equipment, airport equipment, oil and gas drilling equipment. The remaining 40.6 percent of the total Basin GHG emissions are from stationary and area sources. The largest stationary/area source is fuel combustion, which is 27.8 percent of the total Basin GHG emissions (68.6 percent of the GHG emissions from the stationary and area source category).

3.2.2.3 Air Quality – Ozone Depletion

The Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) is an international treaty designed to phase out halogenated hydrocarbons (chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs)), which are considered ozone depleting substances (ODSs). The Montreal Protocol was first signed in September 16, 1987 and has been revised seven times. The United States ratified the original Montreal Protocol and each of its revisions.

3.2.2.3.1 Federal

Under Title VI of the CAA, U.S. EPA is responsible for programs that protect the stratospheric ozone layer. Title 40, Part 82 of the Code of Federal Regulations contains U.S. EPA's regulations to protect the ozone layer. U.S. EPA regulations phase out the production and import of ODSs consistent with the Montreal Protocol. ODSs are typically used as refrigerants or as foam blowing agents. ODS are regulated as Class I or Class II controlled substances. Class I substances have a higher ozone-depleting potential and have been completely phased out in the U.S., except for exemptions allowed under the Montreal Protocol. Class II substances are hydrochlorofluorocarbons (HCFCs), which are transitional substitutes for many Class I substances and are being phased out.

3.2.2.3.2 State

3.2.2.3.2.1 AB 32: Global Warming Solutions Act

Some ODS exhibit high global warming potentials. As stated in Section 3.2.2.2.2.2~~3.1~~, ARB developed a cap and trade regulation under AB 32. The cap and trade regulation includes the Compliance Offset Protocol Ozone Depleting Substances Projects, which provides methods to quantify and report GHG emission reductions associated with the destruction of high global warming potential ODS sourced from and destroyed within the U.S. that would have otherwise been released to the atmosphere. The protocol must be used to quantify and report GHG reductions under the ARB's GHG Cap and Trade Regulation.

3.2.2.3.2.2 Refrigerant Management Program

As part AB 32, ARB adopted a regulation (Refrigerant Management Program) in 2009 to reduce GHG emissions from stationary sources through refrigerant leak detection and monitoring, leak repair, system retirement and retrofitting, reporting and recordkeeping, and proper refrigerant cylinder use, sale, and disposal.

3.2.2.3.2.3 HFC Emission Reduction Measures for Mobile Air Conditioning - Regulation for Small Containers of Automotive Refrigerant

The automotive refrigerant small containers regulation applies to the sale, use, and disposal of small containers of automotive refrigerant with a GWP greater than 150. Emission reductions are achieved through implementation of four requirements: 1) use of a self-sealing valve on the container, 2) improved labeling instructions, 3) a deposit and recycling program for small containers, and 4) an education program that emphasizes best practices for vehicle recharging. This regulation went into effect on January 1, 2010 with a one-year sell-through period for containers manufactured before January 1, 2010. The target recycle rate is initially set at 90 percent, and rose to 95 percent beginning January 1, 2012.

3.2.2.3.2 SCAQMD

The SCAQMD adopted a "Policy on Global Warming and Stratospheric Ozone Depletion" on April 6, 1990. The policy targeted a transition away from chlorofluorocarbons (CFCs) as an industrial refrigerant and propellant in aerosol cans. In March 1992, the SCAQMD Governing Board reaffirmed this policy and adopted amendments to the policy to include the following directives for ODSs:

- phase out the use and corresponding emissions of chlorofluorocarbons (CFCs), methyl chloroform (1,1,1-trichloroethane or TCA), carbon tetrachloride, and halons by December 1995;
- phase out the large quantity use and corresponding emissions of hydrochlorofluorocarbons (HCFCs) by the year 2000;
- develop recycling regulations for HCFCs; and
- develop an emissions inventory and control strategy for methyl bromide.

3.2.3.3.2.1 Rule 1122 – Solvent Degreasers

Rule 1112 applies to all persons who own or operate batch-loaded cold cleaners, open-top vapor degreasers, all types of conveyorized degreasers, and air-tight and airless cleaning systems that carry out solvent degreasing operations with a solvent containing Volatile Organic Compounds (VOCs) or with a NESHAP halogenated solvent. Some ODSs (carbon tetrachloride and 1,1,1-trichloroethane) are NESHAP halogenated solvents.

3.2.2.3.2.2 Rule 1171 – Solvent Cleaning Operations

Rule 1171 reduces emissions of volatile organic compounds (VOCs), toxic air contaminants, and stratospheric ozone-depleting or globalwarming compounds from the use, storage and disposal of solvent cleaning materials in solvent cleaning operations and activities

3.2.2.3.2.3 Rule 1411 - Recovery or Recycling of Refrigerants from Motor Vehicle Air Conditioners

Rule 1411 prohibits release or disposal of refrigerants used in motor vehicle air conditioners and prohibits the sale of refrigerants in containers which contain less than 20 pounds of refrigerant.

3.2.2.3.2.4 Rule 1415 - Reduction of Refrigerant Emissions from Stationary Air Conditioning Systems

Rule 1415 reduces emissions of high-global warming potential refrigerants from stationary air conditioning systems by requiring persons subject to this rule to reclaim, recover, or recycle refrigerant and to minimize refrigerant leakage.

3.2.2.3.2.5 Rule 1418 - Halon Emissions from Fire Extinguishing Equipment

Rule 1418 reduce halon emissions by requiring the recovery and recycling of halon from fire extinguishing systems, by limiting the use of halon to specified necessary applications, and by prohibiting the sale of portable halon fire extinguishers that contain less than five pounds of halon.

SUBCHAPTER 3.3

ENERGY

Regulatory Setting

Energy Trends in General (Statewide)

Alternative Clean Transportation Fuels

Renewable Energy

Consumptive Uses

3.3 ENERGY

This subsection describes existing regulatory setting relative energy production and demand, including alternative and renewable fuels, and trends within California and the district.

3.3.1 Regulatory Setting

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation (U.S. DOT), United States Department of Energy (U.S. DOE), and United States Environmental Protection Agency (U.S. EPA) are three agencies with substantial influence over energy policies and programs. Generally, federal agencies influence transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy related research and development projects, and through funding for transportation infrastructure projects.

On the state level, the California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are two agencies with authority over different aspects of energy. The CPUC regulates privately-owned utilities in the energy, rail, passenger transportation, telecommunications, and water fields. The CEC collects and analyzes energy-related data, prepares state-wide energy policy recommendations and plans, promotes and funds energy efficiency and renewable energy resources programs, plans and directs state response to energy emergencies, and regulates the power plant siting and transmission process. Some of the more relevant federal and state transportation-energy-related laws and plans are discussed in the following subsections.

3.3.1.1 Federal Regulations

3.3.1.1.1 Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. DOT, is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 miles per gallon. Heavy-duty vehicles (e.g., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is not determined for each individual vehicle model, but rather, compliance is determined on the basis of each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by U.S. EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The U.S. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the U.S. DOT is authorized to assess penalties for noncompliance.

3.3.1.1.2 National Energy Act

The National Energy Act of 1978 included the following statues: Energy Tax Act, National Energy Conservation Policy Act, Power Plant and Industrial Fuel Use Act, and the National Gas Policy Act. The Power Plant and Industrial Fuel Use Act restricted the fuel used in power plants, however, these restrictions were lifted in 1987. The Energy Tax Act was superseded by the Energy Policy Acts of 1992 and 2005. The National Gas Policy Act gave the Federal Energy Regulatory Commission authority over natural gas production and established pricing guidelines. The National Energy Conservation Policy Act (NECPA). The NECPA set minimum energy performance standards, which replaced those in the EPCA. The federal standards preempted state standards. The NECPA was amended by the Energy Policy and Conservation Act Amendments of 1985.

3.3.1.1.3 Public Utility Regulatory Policies Act of 1978 (PURPA) (Public Law 95-617)

PURPA was passed in response to the unstable energy climate of the late 1970s. PURPA sought to promote conservation of electric energy. Additionally, PURPA created a new class of nonutility generators, small power producers, from which, along with qualified co-generators, utilities are required to buy power.

PURPA was in part intended to augment electric utility generation with more efficiently produced electricity and to provide equitable rates to electric consumers. Utility companies are required to buy all electricity from qualifying facilities (Qfs) at avoided cost (avoided costs are the incremental savings associated with not having to produce additional units of electricity). PURPA expanded participation of nonutility generators in the electricity market and demonstrated that electricity from nonutility generators could successfully be integrated with a utility's own supply. PURPA requires utilities to buy whatever power is produced by Qfs (usually cogeneration or renewable energy). The Fuel Use Act (FUA) of 1978 (repealed in 1987) also helped Qfs become established. Under FUA, utilities were not allowed to use natural gas to fuel new generating technologies, but Qfs, which were by definition not utilities, were able to take advantage of abundant natural gas and abundant new technologies (such as combined-cycle).

3.3.1.1.4 Energy Policy Act of 1992

The Energy Policy Act of 1992 is comprised of twenty-seven titles. It addressed clean energy use and overall national energy efficiency to reduce dependence on foreign energy, incentives for clean, radioactive waste protection standards, and renewable energy and energy conservation in buildings and efficiency standards for appliances.

3.3.1.1.5 Energy Policy Act of 2005

The Energy Policy Act of 2005 addresses energy efficiency; renewable energy requirements; oil, natural gas and coal; alternative-fuel use; tribal energy, nuclear security; vehicles and vehicle fuels, hydropower and geothermal energy, and climate change technology. The Act provides revised annual energy reduction goals (two percent per year beginning in 2006), revised renewable energy purchase goals, federal procurement of Energy Star or Federal Energy Management Program-designated products, federal green building standards, and fuel cell vehicle and hydrogen energy system research and demonstration.

3.3.1.1.6 Clean Air Act

Section 211(o) of the Clean Air Act (the Act), as amended by the Energy Policy Act of 2005, requires the Administrator of the U.S. Environmental Protection Agency (U.S. EPA) to annually determine a renewable fuel standard (RFS), which is applicable to refiners, importers, and certain blenders of gasoline, and publish the standard in the Federal Register by November 30 of each year. On the basis of this standard, each obligated party determines the volume of renewable fuel that it must ensure is consumed as motor vehicle fuel. This standard is calculated as a percentage, by dividing the amount of renewable fuel that the Act requires to be blended into gasoline for a given year by the amount of gasoline expected to be used during that year, including certain adjustments specified by the Act.

3.3.1.1.7 Corporate Average Fuel Economy (CAFE) Program

Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the U.S. The CAFE program, which is administered by the U.S. EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The U.S. EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

3.3.1.1.8 Energy Independence and Security Act of 2007 (EISA)

The Energy Independence and Security Act of 2007 was signed into law by President Bush on December 19, 2007. The Acts objectives are to move the United States toward greater energy independence and security, increase the production of clean renewable fuels, protect consumers, increase the efficiency of products, buildings and vehicles, promote greenhouse gas research, improve the energy efficiency of the Federal government, and improve vehicle fuel economy.

The renewable fuel standard in the Act requires 36 billion gallons of ethanol per year by 2022, with corn ethanol limited to 15 billion gallons. The new CAFE standard is for light duty vehicles 35 miles per gallon by 2020. The Act also specifies that vehicle attribute-based standards are to be developed separately for cars and light trucks. The Act creates a CAFE credit and transfer program among manufacturers and across a manufacturer's fleet. It would allow an extension through 2019 of the CAFE credits specified under the Alternative Motor Fuels Act. It establishes appliance energy efficiency standards for boilers, dehumidifiers, dishwashers, clothes washers, external power supplies, commercial walk-in coolers and freezers, federal buildings; lighting energy efficiency standards for general service incandescent lighting in 2012; and standards for industrial electric motor efficiency

3.3.1.2 State Regulations

The CEC and CPUC have jurisdiction over the investor-owned utilities (IOUs) in California. Within the district, the CEC also collects information for the Los Angeles Department of Water and Power (LADWP) and the Burbank, Glendale and Pasadena Municipal Utilities. The applicable state regulations, laws, and executive orders relevant to energy use are discussed below.

3.3.1.2.1 California Building Energy Efficiency Standards: Title 24

California established statewide building energy efficiency standards following legislative action. The legislation required the standards to be cost-effective based on the building life cycle and to include both prescriptive and performance-based approaches. The 2005 Building Energy Efficiency Standards were adopted in November 2003, took effect October 1, 2005, and followed by a 2008 update.

3.3.1.2.2 AB 1007, Alternative Fuels Plan

Assembly Bill (AB) 1007, (Pavley, Chapter 371, Statutes of 2005) requires the CEC to prepare a state plan to increase the use of alternative fuels in California (Alternative Fuels Plan). The CEC prepared the plan in partnership with CARB, and in consultation with the other state, federal and local agencies in December 2007. The Alternative Fuels Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce GHG emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

3.3.1.2.3 AB 1493, Vehicle Climate Change Standards

AB 1493 required the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light-duty trucks. Regulations were adopted by CARB in September 2004. Compliance with these standards is expected to improve fuel efficiency.

3.3.1.2.4 Senate Bill (SB) 1368, Greenhouse Gas Emissions Performance Standard for Major Power Plant Investments

This law requires the CEC to develop and adopt by regulation a greenhouse gas emissions performance standard for long-term procurement of electricity by local publicly-owned utilities. The CEC must adopt the standard on or before June 30, 2007 and must be consistent with the standard adopted by the CPUC for load-serving entities under their jurisdiction on or before February 1, 2007. On January 25, 2007, and on May 23, 2007, respectively, the CPUC and the CEC adopted specific regulations regarding greenhouse gas emissions performance standards for IOUs and other electricity service providers under SB 1368. Compliance with these standards is expected to improve fuel use.

3.3.1.2.5 California Solar Initiative

On January 12, 2006, the CPUC approved the California Solar Initiative (CSI), which provides $2.9 billion in incentives between 2007 and 2017. CSI is part of the Go Solar California campaign, and builds on 10 years of state solar rebates offered to California's IOU territories: Pacific Gas & Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E.) The California Solar Initiative is overseen by the CPUC, and includes a $2.5 billion program for commercial and existing residential customers, funded through revenues and collected from gas and electric utility distribution rates. Furthermore, the CEC will manage $350 million targeted for new residential building construction, utilizing funds already allocated to the CEC to foster renewable projects between 2007 and 2011.

Current incentives provide an upfront, capacity-based payment for a new system. In its August 24, 2006 decision, the CPUC shifted the program from volume-based to performance-based incentives and clarified many elements of the program's design and administration. These changes were enacted in 2007, when the CSI incentive system changed to performance-based payments.

3.3.1.2.6 Reducing California's Petroleum Dependence

The CEC and CARB produced a joint report Reducing California's Petroleum Dependence to highlight petroleum consumption and to establish a performance based goal to reduce petroleum consumption in California over the next thirty years. The report includes the following recommendations to the Governor and Legislature regarding petroleum:

- Adopt the recommended statewide goal of reducing demand for on-road gasoline and diesel to 15 percent below the 2003 demand level by 2020 and maintaining that level for the foreseeable future.
- Work with the California delegation and other states to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles.
- Establish a goal to increase the use of non-petroleum fuels to 20 percent of on-road fuel consumption by 2020, and 30 percent by 2030.

The CEC will use these recommendations when developing its series of recommendations to the Governor and Legislature for the integrated energy plan for electricity, natural gas, and transportation fuels.

3.3.1.2.7 Renewables Portfolio Standard

California's renewables portfolio standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable energy resources by at least one percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. If a seller falls short in a given year, they must procure more renewables in succeeding years to make up the shortfall. Once a retail seller reaches 20 percent, they need not increase their procurement in succeeding years. RPS was enacted via SB 1078 (Sher), signed September 2002 by Governor Davis. The CEC and the CPUC are jointly implementing the standard. In 2006, RPS was modified by Senate Bill 107 to require retail sellers of electricity to reach the 20 percent renewables goal by 2010. In 2011, RPS was further modified by Senate Bill 2 to require retailers to reach 33 percent renewable energy by 2020.

3.3.1.2.8 California Environmental Quality Act (CEQA)

Appendix F of the CEQA Guidelines describes the types of information and analyses related to energy conservation that are to be included in EIRs that are prepared pursuant to CEQA. In Appendix F of the CEQA Guidelines, energy conservation is described in terms of decreased per capita energy consumption, decreased reliance on natural gas and oil, and increased reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

3.3.1.3 Local Regulations

3.3.1.1.1 Clean Cities Program

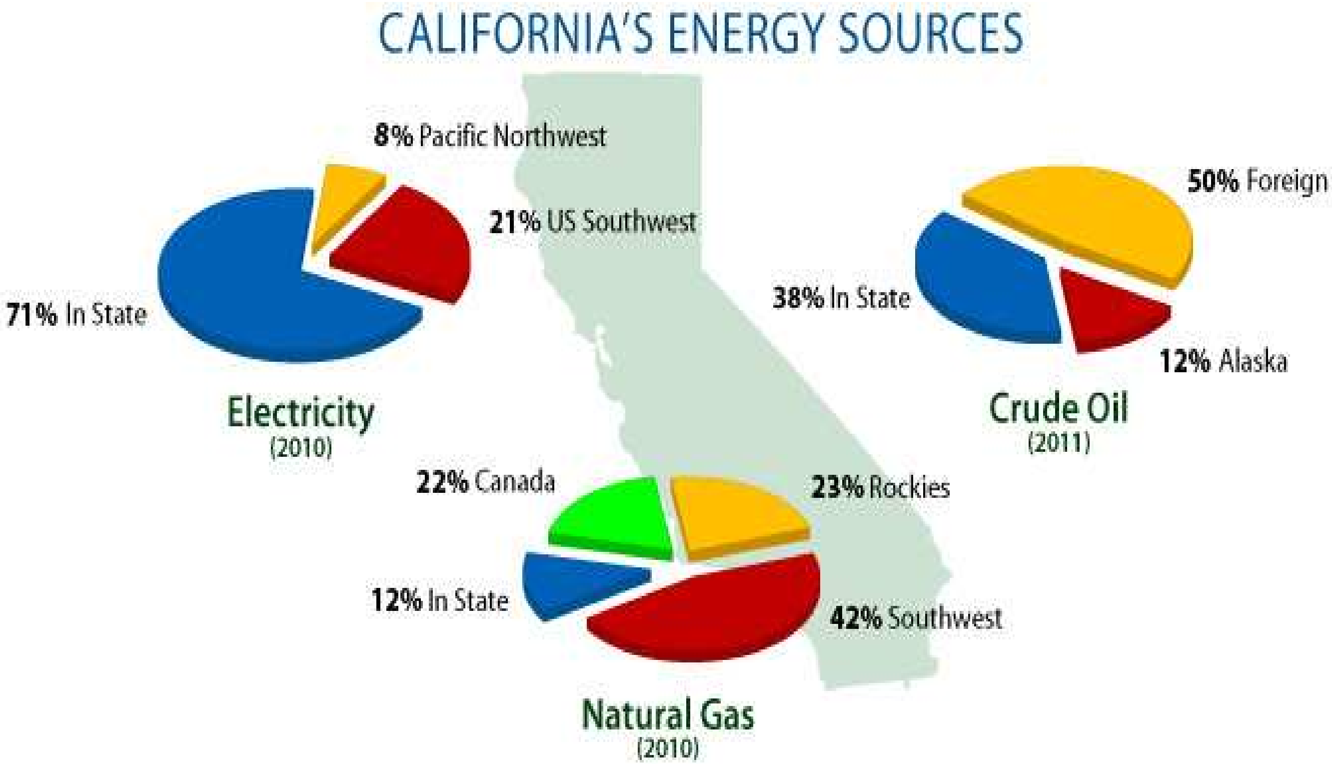
The U.S. DOE Clean Cities Program promotes voluntary, locally based government/industry partnerships for the purpose of expanding the use of alternatives to gasoline and diesel fuel by accelerating the deployment of alternative fuel vehicles and building a local alternative fuel vehicle refueling infrastructure. The mission of the Clean Cities Program is to advance the nation's and energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption. Clean Cities carries out this mission through a network of more than 80 volunteer coalitions, which develop public/private partnerships to promote alternative fuels and vehicles, fuel blends, fuel economy, hybrid vehicles, and idle reduction.

3.3.1.1.2 San Gabriel Valley Energy Efficiency Partnership

In April 2006, the SCAG's Regional Council authorized SCAG's Executive Director to enter into a partnership with SCE to incentivize energy efficiency programs in the San Gabriel Valley Subregion. The San Gabriel Valley Energy Wise Program (SGVEWP) agreement was fully executed on October 20, 2006 with the main goal to save a combined three million kilowatt-hours (kWh) by providing technical assistance and incentive packages to cities by 2008. The program has been extended seeks to reduce energy usage in the region by approximately five million kWh by 2012. The SGVEWP is funded by California utility customers and administered by SCE under the auspices of the CPUC.

3.3.2 Energy Trends In General (Statewide)

Figure 3.3-1 shows California's major sources of energy. In 2010, 71 percent of the electricity came from in-state sources, while 29 percent was imported into the state. The electricity imported totaled 85,169 gigawatt hours (GWh), with 24,677 GWh coming from the Pacific Northwest, and 60,492 GWh from the Southwest. (Note: A gigawatt is equal to one million kilowatts). For natural gas in 2010, 42 percent came from the Southwest, 22 percent from Canada, 12 percent from in-state, and 23 percent from the Rockies. Also in 2010, 38 percent of the crude oil came from in state, with 12 percent coming from Alaska, and 50 percent being supplied by foreign sources (CEC, 2012).



Source: California Energy Commission

FIGURE 3.3-1

California's Major Sources of Energy

3.3.2.1 Electricity

Power plants in California provided approximately 71 percent of the total in-state electricity demand in 2010 of which 15 percent came from renewable sources such as biomass, geothermal, small hydro, solar, and wind. The Pacific Northwest provided another 8.5 percent of the total electricity demand of which 31 percent came from renewable sources. The Southwestern U.S. provided 20.8 percent of the total electricity demand, with 11.1 percent coming from renewable sources. In total, 13.7 percent of the total in-state electricity demand for 2010 came from renewable sources (CEC, 2012a). Five of the state's largest power plants are located in Basin (U.S. Energy Information Administration, 2012). The largest power plants in California are located in northern California. The Moss Landing Natural Gas Power Plant (net summer capacity 2,529 megawatts (MW)) is located in Monterey Bay in Monterey County and the Diablo Canyon Nuclear Plant (net summer capacity 2,240 MW) is located in Avila Beach in San Luis Obispo County. The third and fourth largest power plants in California are the San Onofre Nuclear Generating Station (net summer capacity 2,150 MW) in San Diego and the AES Alamitos Natural Gas Power Generating Station (net summer capacity 1,997 MW) in Long Beach in Los Angeles County. The San Onofre Nuclear Generating Station is operated by Southern California Edison International, San Diego Gas & Electric Company, and the City of Riverside Utilities Department. It is currently not operating while it is undergoing repairs. The Los Angeles Department of Water and Power (LADWP) ~~County~~ operates the state's fifth and sixth largest power plants: the Castaic Pump-Storage Power Plant[1] in Castaic (net summer capacity 1,620 MW) and Haynes Natural Gas Power Plant (net summer capacity 1,524MW) in Long Beach. The seventh and eighth largest power plants in California are outside of the Basin: the Ormond Beach Natural Gas Power Plant (net summer capacity 1,516 MW) in City and County of Oxnard and Pittsburg Natural Gas Power Plant (net summer capacity 1,311 MW) in the City of Pittsburg in Contra Costa County. The AES Redondo Beach Natural Gas Power Plant (net summer capacity 1,310 MW) in Redondo Beach is the ninth largest in the state (AES, 2010). The Helms Pumped Storage (net summer capacity 1,212 MW) in Sierra National Forest of Fresno County is the tenth largest power plant in the state.

Local electricity distribution service is provided to customers within southern California by one of two investor-owned utilities – either SCE or SDG&E – or by a publicly owned utility, such as the Los Angeles Department of Water and Power (LADWP) and the Imperial Irrigation District. SCE is the largest electric utility company in Southern California with a service area that covers all or nearly all of Orange, San Bernardino, and Ventura Counties, and most of Los Angeles and Riverside Counties. SCE delivers 78 percent of the retail electricity sales to residents and businesses in southern California. SDG&E provides local distribution service to the southern portion of Orange County (SCAG, 2012).

The LADWP is the largest of the publicly owned electric utilities in southern California. LADWP provides electricity service to the most of the customers located in the City of Los Angeles and provides approximately 20 percent of the total electricity demand in the Basin. The other publicly owned utilities in southern California include Anaheim, Azusa, Banning, Burbank, Cerritos, Colton, Glendale, Pasadena, Riverside, Vernon, and the Imperial Irrigation District (SCAG, 2012).

Table 3.3-1 shows the amount of electricity delivered to residential and nonresidential entities in the counties in the Basin.

[1] The Castaic Pump-Storage Power plant is operated by the LADWP in cooperation with the Department of Water Resources (DWR).

TABLE 3.3-1

2011 Electricity Use GWh (Aggregated, includes self generation and renewables)

Sector	Los Angeles	Orange	Riverside	San Bernardino	Total
Ag & Water Pump	1,453	1,600	623	483	4,159
Commercial	26,093	9,151	5,137	4,510	44,890
Industry	11,384	2,588	1,071	2,620	17,662
Mining	1,346	356	129	214	2,045
Residential	19,292	6,682	6,644	4,717	37,334
Streetlight	267	115	80	56	517
TCU	4,065	979	504	953	6,501
Total	63,899	21,470	14,188	13,553	113,109

Source: California Energy Commission –email sent by Steven Mac on August 24, 2012.

3.3.2.2 Natural Gas

Four regions supply California with natural gas. Three of them—the Southwestern U.S., the Rocky Mountains, and Canada—supplied 88 percent of all the natural gas consumed in California in 2010. The remainder is produced in California (CEC, 2012c).

Southern California Gas Company (SoCalGas), an investor-owned utility company, provides natural gas service throughout the district, except for the southern portion of Orange County, portions of San Bernardino County, and the City of Long Beach. The Long Beach Gas & Oil Department (LBGOD) is municipally owned and operated by the City of Long Beach, providing gas service for the cities of Long Beach and Signal Hill (LBGOD, 2012). San Diego Gas & Electric Company provides natural gas services to the southern portion of Orange County. In San Bernardino County, Southwest Gas Corporation provides natural gas services to Victorville, Big Bear, Barstow, and Needles (SCAG, 2012).

Table 3.3-2 provides the estimated use of natural gas in California by residential, commercial and industrial sectors. In 2010, about 50 percent of the natural gas consumed in California was for electric generation purposes (2,312 + 784/6,133).

California is currently ranked fourth among the oil producing states, behind Texas, Louisiana, and Alaska, respectively. Crude oil production in California averaged 629,500 barrels per day in 2009, a decline of 3.04 percent from 2008. Statewide oil production has declined to levels not seen since 1941 (DOGGR, ~~2009~~2010). California also ranks first in gasoline and jet fuel consumption and third in distillate fuel consumption (U.S. EIA, 2012).

3.3.2.3 Liquid Petroleum Fuels

California relies on oil produced within the state, Alaska, and foreign nations to supply its refineries and produce the petroleum that is used in automobiles and for other purposes. The percentage of oil that is imported from foreign nations has increased dramatically over the past 20 years. For example, in 1991, California imported just four percent of oil from foreign sources (30.7 million barrels out of a total of 683.5 million barrels), and in 2011, California imported 49.9 percent of oil from foreign sources (300 million barrels out of a total of 600.7 million barrels). The long-term oil supply outlook for California remains one of declining in-state and Alaska supplies leading to increasing dependence on foreign oil sources (CEC, 2012d).

TABLE 3.3-2

California Natural Gas Demand 2010
(Million Cubic Feet per Day – MMcf/d)

Sector	Utility	Non-Utility	Total
Residential	1,193	--	1,193
Commercial	493	--	493
Natural Gas Vehicles	33	--	33
Industrial	810	--	810
Electric Generation	1,856	456	2,312
Enhanced Oil Recovery (EOR) Steaming	30	784	814
Wholesale / International + Exchange	230	--	230
Company Use and Unaccounted-for	85	--	85
EOR Cogeneration / Industrial	--	784	784
Total	**4,729**	**1,403**	**6,133**

Source: California Gas Report, 2010

Most gasoline and diesel fuel sold in California for on-road motor vehicles is refined in California to meet state-specific formulations required by CARB. Major petroleum refineries in California are concentrated in three counties: Contra Costa County in northern California, Kern County in central California, and Los Angeles County in southern California. In Los Angeles County, petroleum refineries are located mostly in the southern portion of the county (SCAG, 2012). In 2010 14,860 million gallons of gasoline and 1,414 million gallons of diesel were sold by retail facilities. Sales data reported does not include commercial fleets, government entities, private cardlocks (facilities open only to participating companies and not the general public), or rental facilities/equipment yards. The state total and sales by county are presented in Table 3.3.-3. In fiscal year 2011, 14,728,734,063 gallons of gasoline and 2,564,017,901 gallons of diesel were sold in California (California State Board of Equalization, 2012). The volume of gasoline also includes aviation fuel.

3.3.3 Alternative Clean Transportation Fuels

The demand for transportation fuels in California is increasing at a rapid rate. It is projected to grow by almost 35 percent over the next 20 years. Unless habits change, petroleum will be the primary source of California's transportation fuels for the foreseeable future. As demand continues to rise and in-state and Alaskan petroleum supplies diminish, California will rely more and more on foreign imports of crude oil (Consumer Energy Center, 2012).

TABLE 3.3-3

Retail Gasoline Sales by California Total and by County
(millions of gallons per year)

Description	California	Los Angeles	Orange	Riverside	San Bernardino
Gasoline [a]	14,860	3,658	1,406	952	902
Diesel [b]	1,414	235	47	93	149

[a] CEC, 2012k
[b] CEC, 2012l

Alternative fuels, as defined by the Energy Policy Act of 1992, include ethanol, natural gas, propane, hydrogen, biodiesel, electricity, methanol, and P-Series fuels, a family of renewable, non-petroleum liquid fuels that can substitute for gasoline. These fuels are being used worldwide in a variety of vehicle applications. Use of these fuels for transportation can generally reduce air pollutant emissions and can be domestically produced and, in some cases, derived from renewable sources. The Energy Policy Act of 2005 directed the U.S. DOE to carry out a study to plan for the transition from petroleum to hydrogen in a significant percentage of vehicles sold by 2020.

Use of renewable and other alternative fuels in the United States and California is expected to continue growing, primarily as a consequence of federal and state regulations mandating ever-increasing levels of renewable content in gasoline and diesel fuel, carbon reduction rules, and incentives for increasing alternative fuel consumption.

3.3.3.1 Biodiesel

Biodiesel is a domestically produced, renewable fuel that can be manufactured from vegetable oils, animal fats, or recycled restaurant greases. According to the U.S. DOE, pure biodiesel (B100) is considered an alternative fuel under Energy Policy Act. Lower-level biodiesel blends are not considered alternative fuels, but covered fleets can earn one Energy Policy Act credit for every 450 gallons of B100 purchased for use in blends of 20 percent or higher (SCAG, 2012).

Biodiesel is the only alternative fuel to have fully completed the health effects testing requirements under the Clean Air Act (CCA). The use of biodiesel in a conventional diesel engine results in substantial reductions of unburned hydrocarbons, carbon monoxide, and particulate matter compared to emissions from diesel fuel (Consumer Energy Center, 2012a).

Production of biodiesel in the United States dramatically increased in response to federal legislation that went into effect in 2005 included a $1 per gallon blending credit for all biodiesel blended with conventional diesel fuel, but declined in 2009 and 2010 with the temporary loss of the subsidy in conjunction with poor production economics (high feedstock costs relative to market price of diesel fuel). Output is expected to rebound as refiners and other obligated parties strive to meet biodiesel blending requirements mandated by the Renewables Fuels Standard Expansion (RFS2) and could set record levels of production (CEC, 2011).

Biodiesel use in California has been modest over the last several years due to an inadequate level of distribution infrastructure (lack of storage tanks at terminals) and varying approaches and interpretations of regulations controlling the concentration of biodiesel that is permissible in USTs. As such, biodiesel use in California is estimated to have been no higher than 20 million gallons over the last several years. Table 3.3-4 shows the reported retail sale of biodiesel was 1,673,555 gallons in 2010 (CEC, 2012m). Retail sales do not include distributed by commercial fleets, government entities, private cardlocks (unattended dispensing facilities not open to the public), rental facilities/equipment yards, and special user groups. Biodiesel use is expected to increase in California as the distribution and retail infrastructure improves, storage tank issues are fully resolved, and obligated parties under the state's LCFS turn to greater quantities of biodiesel to help achieve compliance with their sales of diesel fuel (CEC, 2011).

TABLE 3.3-4

Reported Retail Biodiesel Sales in California in 2010
(gallons per year)

Reporting Year	Conventional Fuel Component (Gallons)	Biodiesel Component (Gallons)	Total Biodiesel Throughput (Gallons)	Stations Reported
2010	926,043	747,512	1,673,555	44

Source: CEC, 2012m

3.3.3.2 Natural Gas

Natural gas is a mixture of hydrocarbons - mainly methane (CH4) - and is produced either from gas wells or in conjunction with crude oil production worldwide and locally at relatively low cost. The interest in natural gas as an alternative fuel for automobiles stems mainly from its clean burning qualities, its domestic resource base, and its commercial availability to end users. Because of the gaseous nature of this fuel, it must be stored onboard a vehicle in either a compressed gaseous state (CNG) or in a liquefied state (LNG) (SCAG, 2012).

Natural gas vehicles have been introduced in a wide variety of commercial applications, from light-duty trucks and sedans (e.g., taxi cabs), to heavy-duty vehicles (e.g., transit buses, street sweepers, and school buses). In California, transit agency buses are some of the most visible CNG vehicles.

With consumption of natural gas increasing nationwide, 21 percent from 2006 to 2010 (U.S. EIA, 2012a), and California's demand expected to grow up to 96 percent in 2030 (CEC, 2011a), the fueling infrastructure for natural gas vehicles continues to grow. California has over 260 natural gas fueling stations. In southern California alone, there are more than 100 public fueling stations in major metropolitan areas from Los Angeles to the Mexican border (U.S. DOE, 2012).

3.3.3.3 Electricity

Electricity can be used as a transportation fuel to power battery electric and fuel cell vehicles. When used to power electric vehicles (EVs), electricity is stored in an energy storage device such as a battery. Fuel cell vehicles use electricity produced from an electrochemical reaction that takes place when hydrogen and oxygen are combined in the fuel cell "stack." The production of electricity using fuel cells takes place without combustion or pollution and leaves only two byproducts, heat and water.

Electric vehicles have several different charging systems: 120-volt, 240-volt, direct-current, and inductive charging. An electric vehicle that accepts 120-volt power can do so from any standard electrical outlet with a 12- or 16-amp dedicated branch circuit (with no other receptacles or loads on the circuit). A 240-volt system requires the installation of a home charging station and is available at most public charging stations. Direct current (DC) fast charging equipment (480 volt) provides 50 kW to the battery. This option enables charging along heavy traffic corridors and at public stations. Inductive charging equipment was installed for all electric vehicles in the early 1990s, such as the GM/Saturn EV-1, Toyota RAV4 EV, and the Chevy S10, and is still being used in certain areas. Some companies are working on inductive charging options for future electric drive vehicles. The most common types of EVs use either 120-volt or 240-volt electrical systems (SCAG, 2012).

The U.S. DOE's Advanced Vehicle Testing Activity (AVTA) promotes the use of EVs in commercial fleets in the United States. During 1996, AVTA requested and received proposals from interested groups to become qualified vehicle testers (QVT). SCE headed one QVT. According to SCE, California’s approximately 20,000 megawatts of excess off-peak (nighttime) electricity capacity would allow the charging of millions of electro-drive technologies without the need for new power generation facilities (SCAG, 2012).

By 2020, the CEC estimates there will be more than 2.5 million plug-in electric vehicles (PEVs) in California. Over the 2011-2012 period, there will be significant investment in California’s charging infrastructure. The Federal government’s American Recovery and Reinvestment Act of 2009 funds matched with CEC program funds in California and other private and public funding are available to support PEV charging infrastructure for the deployment of PEVs in California. Currently there are about 250 public/commercial plug-in stations in Southern California, with more than 2,400 additionally planned (CEC, 2011).

One of the attractions of PEVs compared to internal combustion engine vehicles is the convenience of home charging instead of fueling at a gas station. ICF International estimates that in the early market, roughly 95 percent of charging will either be at home or at fleet facilities. Charging at home may require additional equipment and the broad consensus is that residential charging is the highest priority for deployment because consumers like the convenience and it encourages charging during periods of off-peak electrical demand. The CEC will consider providing PEV consumers with incentives to help defray the cost of home electric vehicle supply equipment (EVSE) (CEC, 2011).

3.3.3.4 Ethanol and E85

Ethanol, or ethyl alcohol, is a clear, colorless liquid that is the same alcohol that is found in alcoholic beverages. In California, ethanol is blended into gasoline (up to 10 percent) for use by most automobiles or in a more pure state (85 percent) as an alterative fuel.

As of June 2011, there was an estimated 472 million gallons of idle ethanol production capacity in the United States, about 3.2 percent of total production capacity of 14.65 billion gallons. Most of these facilities use corn as their sole or primary feedstock. The pace of construction and expansion of additional ethanol plants that use corn for a feed stock has slowed because the RFS2 regulations restrict affected facilities to use a maximum 15 billion gallons of year by 2015 of that corn based ethanol. Refiners and marketers can use even greater quantities of conventional ethanol but they would not earn additional RFS2 compliance credits.

Most ethanol used for fuel in California is being blended into gasoline at concentrations from five to ten percent, and has replaced methyl tertiary butyl ether (MTBE) as a gasoline component. Most gasoline supplied in the state today contains at least six percent ethanol (Consumer Energy Center, 2012b).

Blends of at least 85 percent ethanol are considered alternative fuels under the Energy Policy Act. E85, a blend of 85 percent ethanol and 15 percent gasoline is used in flexible fuel vehicles (FFVs) that are currently offered by most major auto manufacturers. FFVs can run on gasoline, E85, or any combination of the two and qualify as alternative fuel vehicles under Energy Policy Act regulations (SCAG, 2012).

In the United States, ethanol is most widely produced through fermentation and distillation of corn. Due to poor economic conditions, only three of the five California corn-based ethanol facilities are operating. These three facilities collectively produce 170 million gallons of ethanol per year. The two idle facilities have a production capacity of an additional 71 million gallons per year (CEC, 2011).

As of October 2009, there were nearly 409,636 registered FFVs in California which could use either gasoline or E85. Although there is a large population of FFVs in California, there are a modest but growing number of retail stations that offer E85. As of July 2011, there were approximately 60 stations that offered E85 to the public. Table 3.3-5 shows the reported retail sale of E85 was 1,995,812 gallons in 2010 (CEC, 2012m). Retail sales does not include distributed by commercial fleets, government entities, private cardlocks (unattended dispensing facilities not open to the public), rental facilities/equipment yards, and special user groups. With upgraded infrastructure and increasing availability of E85, sales in California are forecast to rise from 13.2 million gallons in 2009 to more than 3,000 million gallons by 2030 (CEC, 2011n).

During 2010, rail imports represented 95.8 percent of the ethanol consumed and in state production represented 4.2 percent. There were no marine imports of ethanol during 2010 due to unfavorable economics in foreign source countries. However, it is projected that ethanol imports from Brazil will be needed to meet demand mandated by the RFS2 and

LCFS requirements. Especially, since ethanol produced from sugarcane in Brazil is the type of commercially available ethanol that has the lowest carbon intensity

3.3.3.5 Methanol and M85

Methanol, also known as wood alcohol, can be used as an alternative fuel in flexible fuel vehicles that run on M85 (a blend of 85 percent methanol and 15 percent gasoline). Methanol was sold in California as part of a public-private partnership demonstration program between the state of California and oil companies. After the demonstration program ended, however, the oil companies discontinued selling M85. M85 is no longer available.

TABLE 3.3-5

Reported Retail E-85 Sales in California in 2010
(gallons per year)

Conventional Fuel Component)	Ethanol Component	Total E-85 Throughput	Count of Facilities
299,372	1,696,440	1,995,812	36

Source: CEC, 2012m

3.3.3.6 Hydrogen as a Transportation Fuel

Hydrogen is the simplest and lightest fuel. At atmospheric pressure and ambient temperatures hydrogen is a colorless, orderless, tasteless, and non-toxic gas that burns invisibly. Hydrogen is being explored for use in combustion engines and fuel cell electric vehicles. The ability to create hydrogen from a variety of resources and its clean-burning properties make it a desirable alternative fuel.

In 2011, there were approximately 250 hydrogen fuel cell vehicles (FCVs) operating in California, compared to only 15 registered in 2009. These vehicles use stored hydrogen, which is combined with oxygen from the atmosphere through an electrochemical reaction to produce electricity, which is then used to power an electric motor. Like battery electric vehicles, FCVs produce no tailpipe emissions and store the hydrogen fuel in on-board pressure tanks. Today's FCVs hold enough hydrogen in their on-board tanks to support driving ranges of roughly 250 miles. Current refueling is relatively quick, taking about three to five minutes per fill for a 700 bar tank (CEC, 2011).

Although there is no significant transportation distribution system currently for hydrogen transportation use, hydrogen could be transported and delivered using the established hydrogen infrastructure; for significant market penetration, the infrastructure will need further development (SCAG, 2012). Currently, there are 23 hydrogen stations in California, only five of which are public (U.S. DOE, 2012).

3.3.3.7 Propane (LPG)

Propane (C3H8) is a three-carbon alkane gas used as a clean-burning, high-energy alternative fuel for decades to power light-, medium-, and heavy-duty propane vehicles.

Propane, also known as liquefied petroleum gas (LPG) or autogas, is produced as a by-product of natural gas processing and petroleum refining. As an alternative fuel, it is stored under pressure inside a tank, as a colorless, odorless liquid and as pressure is released, the liquid propane vaporizes and turns into gas that is used for combustion. Propane has a high octane rating and excellent properties for spark-ignited internal combustion engines. It is non-toxic and presents no threat to soil, surface water, or groundwater.

Propane is a popular fuel choice for vehicles because there is already an infrastructure of pipelines, processing facilities, and storage for its efficient distribution. Domestic availability, high-energy density, clean-burning qualities, and its relatively low cost also add to its popularity.

Propane is the third most commonly used transportation fuel used in the United States, behind gasoline and diesel. Over time, propane has been used in several niche applications such as for fork-lifts, both inside and outside warehouses, and at construction sites. Use of propane can result in lower vehicle maintenance costs, lower emissions, and fuel costs savings when compared to conventional gasoline and diesel. In 2010, the California state fleet operated more than 1,100 vehicles that use propane as an alternative fuel and there are more than 2,200 facilities in California that dispense propane (U.S. DOE, 2012). Propane is an unregulated fuel in California (except for storage and safety issues). Prices are set by supply and demand. Because it is an unregulated commodity, no data is collected by the state on LPG sales or usage. The latest usage data presented by the CEC is that 26 million gallons of propane were dispensed in 2004 (CEC, 2012o).

3.3.4 Renewable Energy

Renewable energy is energy that comes from sources that regenerate and can be sustained indefinitely, unlike fossil fuels, which are exhaustible. The five most common renewable sources are biomass, hydropower, geothermal, wind, and solar. Unlike fossil fuels, non-biomass renewable sources of energy do not directly emit greenhouse gasses.

The production and use of renewable fuels has grown quickly in recent years as a result of higher prices for oil and natural gas, and a number of state and federal government incentives, including the Energy Policy Acts of 2002 and 2005. The use of renewable fuels is expected to continue to grow over the next 30 years, although projections show that reliance on non-renewable fuels to meet most energy needs will continue.

In 2011, consumption of renewable sources in the United States totaled about nine quadrillion British thermal units (Btu) or about nine percent of all energy used nationally. About 13 percent of U.S. electricity was generated from renewable sources in 2011 (U.S. EIA, 2012c). In 2009, 11.6 percent of all electricity came from renewable sources in California (CEC, 2012p).

The Renewables Portfolio Standard (RPS) requires investor-owned utilities, electric service providers, and community choice aggregators regulated by the CPUC to procure 33 percent of retail sales per year from eligible renewable sources by 2020. CPUC issues quarterly renewable energy progress report to the state Legislature, showing that the state's utilities have met the goal of serving 20 percent of their electricity with renewable energy and are already on track to far surpass that goal in 2012 (CEC, 2012n). The quarterly reports report focuses on California's three large investor-owned utilities: Pacific Gas and Electric (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric (SDG&E). These investor-owned utilities currently provide approximately 68 percent of the state's electric retail sales and analyzing this data provides significant insight into the state's RPS progress. On March 1, 2012, the large investor-owned utilities reported in their 2012 RPS. Procurement Progress Reports that they served 20.6 percent of their electricity with RPS-eligible generation in 2011. Table 3.3-6 shows the renewable electricity use in Los Angeles, Orange, Riverside and San Bernardino in 2011.

TABLE 3.3-6

2011 Renewable Electricity Use in GW

Sector	Los Angeles	Orange	Riverside	San Bernardino	Total
Ag & Water Pump	5	0	3	1	10
Commercial	127	32	48	44	252
Industry	10	3	0	3	16
Mining	7	0	1	0	8
Residential	77	32	37	20	166
TCU	51	0	4	12	68
Total	277	67	94	80	519

Source: California Energy Commission –email sent by Steven Mac on August 24, 2012.

3.3.4.1 Hydroelectric Power

Hydroelectric power, or hydropower, is generated when hydraulic turbines connected to electrical generators are turned by the force of flowing or falling water. In 2007, hydro-produced electricity used by California totaled nearly 43,625 GWh or 14.5 percent of the total system power. In-state production accounted for 69.5 percent of all hydroelectricity, while imports from other states totaled 30.5 percent (CEC, 2012e).

California has nearly 343 hydroelectric facilities with an installed capacity about 13,057 MW. Hydro facilities are broken down into two categories: larger than 30 MW capacity facilities are called "large hydro"; smaller than 30 MW capacity facilities are considered "small hydro" and are totaled into the renewable energy portfolio standards. The amount of hydroelectricity produced varies each year, largely dependent on rainfall. During the drought from 1986 to 1992, production fell to less than 22,400 GWh (CEC, 2012e), while total generation increased from 211,028 GWh to 245,535 GWh over the same period of time.

The larger hydro plants on dams in California (such as Shasta, Folsom, Oroville, etc.) are operated by the U.S. Bureau of Reclamation and the state's Department of Water Resources. Smaller plants are operated by utilities, mainly PG&E and Sacramento Municipal Utility District. Licensing of hydro plants is done by the Federal Energy Regulatory Commission with input from state and federal energy, environmental protection, fish and wildlife, and water quality agencies.

3.3.4.2 Geothermal Energy

Geothermal energy technologies use the clean, sustainable heat from the earth. Geothermal resources include the heat retained in shallow ground, hot water and rock found a few miles beneath the Earth's surface, and extremely high-temperature molten rock, also known as magma, located deep in the Earth. Geothermal energy can be used to generate electricity or used directly in many commercial and industrial applications.

The energy from high-temperature reservoirs (225°F - 600°F) can be used by three different types of geothermal power plants to produce electricity. Dry steam plants use steam from underground wells to rotate a turbine, which activates a generator to produce electricity. Binary cycle plants use the heat from lower-temperature reservoirs (225°F - 360°F) to boil a working fluid, which is then vaporized in a heat exchanger and used to power a generator. The water, which never comes into direct contact with the working fluid, is then injected back into the ground to be reheated. The flash stream plant, the most common type of geothermal power plant, uses water at temperatures above 360°F. As this hot water flows up through wells in the ground, the decrease in pressure causes some of the water to boil into steam which is then used to power a generator (U.S. DOE, 2012a).

The most developed of the high-temperature resource areas of the state is the Geysers. North of San Francisco, the Geysers were first tapped as a geothermal resource to generate electricity in 1960. It is one of only two locations in the world where a high-temperature, dry steam is found that can be directly used to turn turbines and generate electricity. Dry steam does not create condensation, which damages steam turbine blades. Other major geothermal locations in the state include the Imperial Valley area east of San Diego and the Coso Hot Springs area near Bakersfield.

Because of its location on the Pacific's "ring of fire" and because of tectonic plate conjunctions, California contains the largest amount of geothermal generating capacity in the United States. In 2007, geothermal energy in California produced 13,000 GWh of electricity. Combined with another 440 GWh of imported geothermal electricity, then geothermal energy produced 4.5 percent of the state's total system power. A total of 42 operating geothermal power plants with an installed capacity of 1,727 MW are in California, about two-thirds of the total United States' geothermal generation (CEC, 2012q).

Direct use systems harness the energy from low to moderate temperature reservoirs (68°-302°F) for various commercial and industrial uses, such as heating buildings, growing plants in greenhouses, drying crops, heating water at fish farms, and pasteurizing milk. Usually, a well is drilled into a geothermal reservoir to provide a steady stream of hot water. The water is brought up through the well, and a mechanical system -- piping, heat exchangers and controls -- delivers the heat directly for its intended use. A disposal system then either injects the cooled water underground or disposes of it on the surface (CEC, 2012f).

Forty-six of California's 58 counties have lower temperature resources for direct-use geothermal. In fact, the City of San Bernardino has developed one of the largest geothermal direct-use projects in North America, heating at least three dozen buildings - including a 15-story high-rise and government facilities - with fluids distributed through 15 miles of pipelines (Consumer Energy Center, 2012c).

3.3.4.3 Biomass Electricity

Biomass technologies break down organic matter to release stored energy from the sun. There are many types of biomass - organic matter such as plants, residue from agriculture and forestry, and the organic component of municipal and industrial wastes - that can now be used to produce fuels, chemicals, and power. This flexibility has resulted in the increased use of biomass technologies with 53 percent of all renewable energy consumed in the United States in 2007 coming from biomass (U.S. DOE, 2012b).

Biopower is the production of electricity or heat from biomass resources by technologies including direct combustion, co-firing, and anaerobic digestion.

3.3.4.3.1 Direct Combustion

Direct combustion using conventional boilers is the most common method of producing electricity from biomass. Boilers primarily burn waste wood products from the agriculture and wood-processing industries to produce steam that spins a turbine connected to a generator to produce electricity. Municipal solid waste power plants use direct combustion to create electricity through three methods:

- Mass Burn: Sorted municipal refuse is fed into a hopper to feed a boiler. The heat from the combustion process is used to turn water into steam to power a turbine-generator.

- Refuse-Derived Fuel: Pelletized or fluff municipal refuse, which comes from a by-product of a resource recovery operation where non-combustible materials are removed, are used to feed a boiler. The heat from the combustion process is used to turn water into steam to power a turbine-generator.

- Pyrolysis/Thermal Gasification: Related technologies where thermal decomposition of organic material at elevated temperatures with little (Thermal Gasification) to no (Pyrolysis) oxygen or air produces combustible gases. The gases are combusted to produce heat and turn water into steam to power a turbine-generator.

3.3.4.3.2 Co-Firing

Co-firing involves replacing a portion of the petroleum-based fuel in high-efficiency coal-fired boilers with biomass. Co-firing has been successfully demonstrated in most boiler technologies, including pulverized coal, cyclone, fluidized bed, and spreader stoker units.

Co-firing biomass can significantly reduce the sulfur dioxide emissions of coal-fired power plants and is a least-cost renewable energy option for many power producers.

3.3.4.3.3 Anaerobic Digestion

Anaerobic digestion, or methane recovery, is a common technology used to convert organic waste to electricity or heat. It is widely used in the agriculture, municipal waste, and brewing industries. In anaerobic digestion, organic matter is decomposed by bacteria in the absence of oxygen to produce methane and other byproducts that form a renewable natural gas (U.S. DOE, 2012b).

The Los Angeles County Sanitation District (LACSD) operates a combined cycle turmbine facility in Carson that uses digester gas to produce 20 MW. In addition, the LACSD operates a landfill gas Rankine cycle steam plant at the Puente Hills Landfill to produce approximately 48 MW.

Lastly, Royal Farms No. 1 in Tulare, California is a third example of ~~uses~~ anaerobic digestion use~~at their facility~~. Hog manure is slurried and sent to a Hypalon-covered lagoon for biogas generation. The collected biogas fuels a 70 kW engine-generator and a 100 kW engine-generator which helps the farm to be able to meet its own monthly electric and heat energy demand (CEC, 2012g).

There are about 132 waste-to-energy plants in California, with a total capacity of almost 1,000 MW. In 2007, 6,236 GWh of electricity in homes and businesses was produced from biomass: burning forestry, agricultural, and urban biomass; converting methane-rich landfill gas to energy; and processing wastewater and dairy biogas into useful energy. Biomass power plants produced 2.1 percent of the total electricity in California in 2007, or about one-fifth of all the renewable energy (CEC, 2012g).

3.3.4.4 Wind Power

Wind power is the conversion of the kinetic energy of the wind into a useful form of energy. Wind can be harnessed by wind turbines, windmills, windpumps, or sails. These technologies use wind power for practical purposes such as generating electricity, grinding grain, pumping water, or propelling a boat.

A wind turbine works much like the propeller of an airplane. The blades of a turbine are tilted at an angle and contoured such that the movement of the air is channeled creating low and high pressures on the blade that force it to move. The blade is connected to a shaft, which in turn is connected to an electrical generator. The mechanical energy of the turning blades is changed into electricity.

California has several wind farms, a group of wind turbines in the same location used to produce electricity, strategically placed in windy areas, as one of the problems with using wind to generate power is that wind is not always constant.

Wind energy plays an integral role in California's electricity portfolio. In 2007, turbines in wind farms generated 6,802 GWh of electricity - about 2.3 percent of the state's gross system power. Additionally, hundreds of homes and farms are using smaller wind turbines to produce electricity (CEC, 2012h).

There are many windy areas in California. Problems with using wind to generate power are that it is not windy all year long nor is the wind speed constant. It is usually windier during the summer months when wind rushes inland from cooler areas, such as near the ocean, to replace hot rising air in California's warm central valleys and deserts. By placing wind turbines in these windy areas, California's wind power supply variance can be minimized. Utility-scale wind power generation facilities can be found in Altamont Pass, Solano, Pacheco Pass, the Tehachapi Ranges, and San Gorgonio Pass.

3.3.4.5 Solar (Photovoltaic Cells)

Solar energy technologies produce electricity from the energy of the sun through photovoltaic (PV) cells, also known as solar cells. PV cells are electricity-producing devices made of semiconductor materials coming in many sizes and shapes, often connected together to ultimately form PV systems. When light shines on a PV cell, the energy of absorbed light transfers to electrons in the atoms of the PV cell semiconductor material causing electrons to escape from their normal positions in the atoms and become part of the electric flow, or current, in an electrical circuit. While small PV systems can provide electricity for homes, businesses, and remote power needs, larger PV systems provide much more electricity for contribution to the electric power system.

The PV cells for small systems can be purchased in two formats: 1) as a stand-alone module that is attached to the roof or on a separate system; or, 2) using integrated roofing materials with dual functions -- as a regular roofing shingle and as a solar cell making electricity.

California's cumulative installed capacity of PV systems in 1998 was 6.3 MW. In 2008, the capacity of PV systems reached about 440 MW, producing 661.5 GWh of electricity for the state (CEC, 2012i).

3.3.4.6 Solar Thermal Energy

Solar thermal energy (STE) is the technology for converting the sun's energy into thermal energy (heat) through solar thermal collectors. The U.S. EIA classifies solar thermal collectors into three categories:

- Low-temperature: Flat plate collectors are used to warm homes, buildings, and swimming pools.
- Medium-temperature: Flat plate collectors are used to heat water or air for residential and commercial uses.
- High-temperature: Mirrors or lenses are used to concentrate STE for electric power production.

Low and medium-temperature collectors can be further classified as either passive or active heating systems. In a passive system, air is circulated past a solar heat surface and through the building by convection (meaning that less dense warm air tends to rise while denser cool air moves downward). No mechanical equipment is needed for passive solar heating. Active heating systems require a collector to absorb and collect solar radiation. Fans or pumps are used to circulate the heated air or heat absorbing fluid. Active systems often include some type of energy storage system.

High-temperature systems used in solar thermal power plants use the sun's rays to heat a fluid to very high temperatures through the use of mirrors or lenses. The fluid is then circulated through pipes so it can transfer its heat to water to produce steam. The steam, in turn, is converted into mechanical energy in a turbine and into electricity by a conventional generator coupled to the turbine.

California has 11 of the 13 solar thermal power plants in the United States. These facilities are concentrated in the desert areas of the state in the Mojave area. Solar thermal plants produced 675 GWh in 2007, or 0.22 percent of the state's total electricity production (CEC, 2012i).

California's electric utility companies are required to use renewable energy to produce 20 percent of their power by 2010 and 33 percent by 2020 and a main source of the required renewable energy will be solar energy. Many large solar energy projects are being proposed in California's desert area on federal Bureau of Land Management (BLM) land. The developments of 34 large solar thermal power plants have been proposed with a planned combined capacity of 24,000 MW (CEC, 2012i).

3.3.5 Consumptive Uses

3.3.5.1 Transportation

Transportation (i.e., the movement of people and goods from place to place) is an important end use of energy in California, accounting for approximately 40 percent of total statewide energy consumption in 2010, and 11.3 percent of total U.S. energy consumption (U.S. EIA, 2012). Nonrenewable energy products derived from crude oil, including gasoline, diesel, kerosene, and residual fuel, provide most of the energy consumed for transportation purposes by on-road motor vehicles (e.g., automobiles and trucks), locomotives, aircraft, and ships. In addition, energy is consumed in connection with construction and maintenance of transportation infrastructure, such as highways, rail facilities, runways, and shipping terminals. Trends in transportation-related technology foretell increased use of electricity and natural gas for transportation purposes.

Transportation energy is derived from a wide variety of petroleum products. Automobiles and trucks consume gasoline and diesel fuel. Turbine aircraft consume kerosene fuel; trucks and locomotives consume diesel fuel; and ships consume residual fuel oil. The transportation sector consumes relatively minor amounts of natural gas or electricity but propelled mainly by air quality laws and regulations, technological innovations in transportation are expected to increasingly rely on compressed natural gas and electricity as energy sources. Biodiesel, derived from plant sources such as used vegetable oils, is a small but growing source of transportation fuel. Vehicles powered by fuels other than gasoline or diesel are referred to as "alternative fuel vehicles" (SCAG, 2008).

3.3.5.2 Residential, Commercial, Industrial, and Other Uses

Major energy consumption sectors (in addition to transportation) include residential, commercial, industrial uses as well as street lighting, mining, and agriculture. Unlike transportation, these sectors primarily consume electricity and natural gas. Total annual electricity consumption in the SCAG region is approximately 123,678 million kWh (39,432 kWh for residential uses and 84,246 kWh for nonresidential uses) (SCAG, 2008). The residential, commercial, and industrial sectors account for approximately 30, 39, and 19 percent, respectively, of total regional electricity consumption. The agriculture, mining and other uses account for another 14 percent (CEC, 2005).

Within the residential sector, lighting, small appliances, and refrigeration account for most (approximately 60 percent) of the electricity consumption, and within the industrial and commercial sector, lighting, motors, and air cooling account for most (approximately 65 percent) of the electricity consumption. Electricity use by households varies depending on the local climate and on the housing type (e.g., single-family vs. multi-family), as per the four distinct geographic zones in the SCAG region: the cooler and more temperate coastal zone; an inland valley zone; the California central valley zone, and the desert zone, where temperatures are more extreme.

Californians consumed approximately 12,774 million therms of natural gas per year in 2010 (CEC, 2012r). Approximately, 4,662 million therms of natural gas per year were consumed in Los Angeles, Orange, Riverside and San Bernardino Counties (CEC, 2012s). The California Energy Commission (CEC) expects residential natural gas use to increase by 1.3 percent per year and commercial natural gas use to increase by 1.8 percent per year. Industrial natural gas demand increased in 2010 over 2009. The most recent data from the CEC show that the residential sector uses the largest amount of natural gas, both across the state and in the SCAG region. Statewide, the industrial sector was second in the amount of natural gas consumed. The commercial sector falls behind residential, mining, and industrial uses in natural gas consumption in the SCAG region and statewide. The agricultural sector accounts for only one percent of the natural gas use statewide and in the SCAG region.

3.3.5.3 Consumption Reduction Efforts

There are various policies and initiatives to reduce petroleum vehicle fuel consumption and increase the share of renewable energy generation and use in the region. These strategies include energy efficient building practices, smarter land use with access to public transportation, increasing automobile fuel efficiency, and participating in energy efficiency incentive program. All publicly-owned utilities and most municipal-owned utilities that provide electric and natural gas service also administer energy conservation programs. These programs typically include home energy audits; incentives for replacement of existing appliances with new, energy-efficient models; provision of resources to inform businesses on development and operation of energy-efficient buildings; and construction of infrastructure to accommodate increased use of motor vehicles powered by natural gas or electricity (CEC, 2012s).

SUBCHAPTER 3.4

HAZARDS AND HAZARDOUS MATERIALS

Introduction

Hazardous Materials Regulations

Emergency Response to Hazardous Materials and Waste Incidents

Hazardous Materials Incidents

Hazards Associated with Air Pollution Control, Coating Reformulations, and Alternative Fuels

3.4 HAZARDS AND HAZARDOUS MATERIALS

3.4.1 Introduction

The goal of the 2012 AQMP is to attain the federal PM2.5 ambient air quality standards and make expeditious progress in attaining the federal one-hour and eight-hour ozone standards thereby improving air quality and protecting public health. Some of the proposed 2012 AQMP control measures intended to improve overall air quality may have direct or indirect hazards and hazardous materials impacts associated with their implementation. Hazard concerns are related to the potential for fires, explosions or the release of hazardous materials/substances in the event of an accident or upset conditions.

The potential for hazards exist in the production, use, storage, and transportation of hazardous materials. Hazardous materials may be found at industrial production and processing facilities. Some facilities produce hazardous materials as their end product, while others use such materials as an input to their production process. Examples of hazardous materials used as consumer products include gasoline, solvents, and coatings/paints. Hazardous materials are stored at facilities that produce such materials and at facilities where hazardous materials are a part of the production process. Specifically, storage refers to the bulk handling of hazardous materials before and after they are transported to the general geographical area of use. Currently, hazardous materials are transported throughout the district via all modes of transportation including rail, highway, water, air, and pipeline.

The Initial Study for the 2012 AQMP identified the use of reformulated coatings, solvents, and consumer products, potential exposure to toxic air contaminants, flammability and toxicity of reformulated products, add-on control devices (e.g., SCRs), and use of alternative fuels and fuel additives as possibly increasing the potential for hazards.

3.4.2 Hazardous Materials Regulations

Incidents of harm to human health and the environment associated with hazardous materials have created a public awareness of the potential for adverse effects from careless handling and/or use of these substances. As a result, the use, storage and transport of hazardous materials are subject to numerous laws and regulations at all levels of government. The most relevant existing hazardous materials laws and regulations include hazardous materials management planning, hazardous materials transportation, hazardous materials worker safety requirements, hazardous waste handling requirements and emergency response to hazardous materials and waste incidents. Potential risk of upset is a factor in the production, use, storage and transportation of hazardous materials. Risk of upset concerns are related to the risks of explosions or the release of hazardous substances in the event of an accident or upset. The most relevant hazardous materials laws and regulations are summarized in the following subsection of this section.

3.4.2.1 Definitions

A number of properties may cause a substance to be hazardous, including toxicity, ignitability, corrosivity, and reactivity. The term "hazardous material" is defined in different ways for different regulatory programs. For the purposes of this Final Program EIR, the term "hazardous materials" refers to both hazardous materials and hazardous wastes. A hazardous material is defined as hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local regulatory agency or if it has characteristics defined as hazardous by such an agency. The California Health & Safety Code §25501 (k) defines hazardous material as follows:

> "Hazardous material" means any material that because of its quantity, concentrations, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. "Hazardous materials" include but are not limited to hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Examples of the types of materials and wastes considered hazardous are hazardous chemicals (e.g., toxic, ignitable, corrosive, and reactive materials), radioactive materials, and medical (infectious) waste. The characteristics of toxicity, ignitability, corrosivity, and reactivity are defined in Title 22, California Code of Regulations (CCR), §66261.20-66261.24 and are summarized below:

> **Toxic Substances:** Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability, or even death. For example, such substances can cause disorientation, acute allergic reactions, asphyxiation, skin irritation, or other adverse health effects if human exposure exceeds certain levels. (The level depends on the substances involved and are chemical-specific.) Carcinogens (substances that can cause cancer) are a special class of toxic substances. Examples of toxic substances include benzene (a component of gasoline and a suspected carcinogen) and methylene chloride (a common laboratory solvent and a suspected carcinogen).
>
> **Ignitable Substances:** Ignitable substances are hazardous because of their ability to burn. Gasoline, hexane, and natural gas are examples of ignitable substances.
>
> **Corrosive Materials:** Corrosive materials can cause severe burns. Corrosives include strong acids and bases such as sodium hydroxide (lye) or sulfuric acid (battery acid).
>
> **Reactive Materials:** Reactive materials may cause explosions or generate toxic gases. Explosives, pure sodium or potassium metals (which react violently with water), and cyanides are examples of reactive materials.

3.4.2.2 Federal Regulations

The U.S. EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment over air, water, and land. The U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The U.S. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and Indian tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, Congress has enacted numerous environmental laws that pertain to hazardous materials, for the U.S. EPA to implement as well as to other agencies at the federal, state and local level, as described in the following subsections.

3.4.2.2.1 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) was enacted by Congress in 1976 (see 15 U.S.C. §2601 et seq.) and gave the U.S. EPA the authority to protect the public from unreasonable risk of injury to health or the environment by regulating the manufacture, sale, and use of chemicals currently produced or imported into the United States. The TSCA, however, does not address wastes produced as byproducts of manufacturing. The types of chemicals regulated by the act fall into two categories: existing and new. New chemicals are defined as "any chemical substance which is not included in the chemical substance list compiled and published under [TSCA] section 8(b)." This list included all of chemical substances manufactured or imported into the United States prior to December 1979. Existing chemicals include any chemical currently listed under section 8 (b). The distinction between existing and new chemicals is necessary as the act regulates each category of chemicals in different ways. The U.S. EPA repeatedly screens both new and existing chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. The U.S. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk.

3.4.2.2.2 Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA) is a federal law adopted by Congress in 1986 that is designed to help communities plan for emergencies involving hazardous substances. EPCRA establishes requirements for federal, state and local governments, Indian tribes, and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals. The Community Right-to-Know provisions help increase the public's knowledge and access to information on chemicals at individual facilities, their uses, and releases into the environment. States and communities, working with facilities, can use the information to improve chemical safety and protect public health and the environment. There are four major provisions of EPCRA:

1) Emergency Planning (Sections 301 – 303) requires local governments to prepare chemical emergency response plans, and to review plans at least annually. These sections also require state governments to oversee and coordinate local planning efforts. Facilities that maintain Extremely Hazardous Substances (EHS) on-site (see 40 CFR Part 355 for the list of EHS chemicals) in quantities greater than

corresponding Threshold Planning Quantities must cooperate in the preparation of the emergency plan.

2) Emergency Release Notification (Section 304) requires facilities to immediately report accidental releases of EHS chemicals and hazardous substances in quantities greater than corresponding Reportable Quantities (RQs) as defined under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to state and local officials. Information about accidental chemical releases must be made available to the public.

3) Hazardous Chemical Storage Reporting (Sections 311 – 312) requires facilities that manufacture, process, or store designated hazardous chemicals to make Material Safety Data Sheets (MSDSs) describing the properties and health effects of these chemicals available to state and local officials and local fire departments. These sections also require facilities to report to state and local officials and local fire departments, inventories of all on-site chemicals for which MSDSs exist. Lastly, information about chemical inventories at facilities and MSDSs must be available to the public.

4) Toxic Chemical Release Inventory (Section 313) requires facilities to annually complete and submit a Toxic Chemical Release Inventory Form for each Toxic Release Inventory (TRI) chemical that are manufactured or otherwise used above the applicable threshold quantities.

Implementation of EPCRA has been delegated to the State of California. The California Emergency Management Agency requires facilities to develop a Hazardous Materials Business Plan if they handle hazardous materials in quantities equal to or greater than 55 gallons, 500 pounds, or 200 cubic feet of gas or extremely hazardous substances above the threshold planning quantity. The Hazardous Materials Business Plan is provided to State and local emergency response agencies and includes inventories of hazardous materials, an emergency plan, and implements a training program for employees.

3.4.2.2.3 Hazardous Materials Transportation Act

Hazardous Materials Transportation Act: The Hazardous Material Transportation Act (HMTA), adopted in 1975 (see 49 U.S.C. 5101 – 5127), gave the Secretary of Transportation the regulatory and enforcement authority to provide adequate protection against the risks to life and property inherent in the transportation of hazardous material in commerce. The United States Department of Transportation (U.S. DOT) (see 49 CFR Parts 171-180) oversees the movement of hazardous materials at the federal level. The Hazardous Materials Transportation Act requires that carriers report accidental releases of hazardous materials to U.S. DOT at the earliest practical moment. Other incidents that must be reported include deaths, injuries requiring hospitalization, and property damage exceeding $50,000. The hazardous material regulations also contain emergency response provisions which include incident reporting requirements. Reports of major incidents go to the National Response Center, which in turn is linked with CHEMTREC, a public service hotline established by the chemical manufacturing industry for emergency responders to obtain information and assistance for emergency incidents involving chemicals and hazardous materials.

The Research and Special Programs Administration (RSPA) of the U.S. DOT implements the hazardous materials regulations. The regulations cover the definition and classification of hazardous materials, communication of hazards to workers and the public, packaging and labeling requirements, operational rules for shippers, and training. These regulations apply to interstate, intrastate, and foreign commerce by air, rail, ships, and motor vehicles, and also cover hazardous waste shipments. The Federal Aviation Administration Office of Hazardous Materials Safety is responsible for overseeing the safe handling of hazardous materials aboard aircraft. The Federal Railroad Administration oversees the transportation of hazardous materials by rail. The U.S. Coast Guard regulates the bulk transport of hazardous materials by sea. The Federal Highway Administration (FHWA) is responsible for highway routing of hazardous materials and issuing highway safety permits.

3.4.2.2.4 Hazardous Materials Waste Regulations

Resource Conservation and Recovery Act: The Resource Conservation and Recovery Act (RCRA) was adopted in 1976 (see 40 CFR Parts 238-282) and authorizes the U.S. EPA to control the generation, transportation, treatment, storage, and disposal of hazardous waste. The RCRA regulation specifies requirements for generators, including waste minimization methods, as well as for transporters and for treatment, storage, and disposal facilities. The RCRA regulation also includes restrictions on land disposal of wastes and used oil management standards. Under RCRA, hazardous wastes must be tracked from the time of generation to the point of disposal. In 1984, RCRA was amended with addition of the Hazardous and Solid Waste Amendments, which authorized increased enforcement by the U.S. EPA, more strict hazardous waste standards, and a comprehensive Underground Storage Tank (UST) program. Likewise, the Hazardous and Solid Waste Amendments focused on waste reduction and corrective action for hazardous releases. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Amendments. Individual states may implement their own hazardous waste programs under RCRA, with approval by the U.S. EPA.

Comprehensive Environmental Response, Compensation and Liability Act: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which is often commonly referred to as Superfund, is a federal statute that was enacted in 1980 to address abandoned sites containing hazardous waste and/or contamination. CERCLA was amended in 1986 by the Superfund Amendments and Reauthorization Act, and by the Small Business Liability Relief and Brownfields Revitalization Act of 2002.

CERCLA contains prohibitions and requirements concerning closed and abandoned hazardous waste sites; establishes liability of persons responsible for releases of hazardous waste at these sites; and creates a trust fund to provide for cleanup when no responsible party can be identified. The trust fund is funded largely by a tax on the chemical and petroleum industries. CERCLA also provides federal jurisdiction to respond directly to releases or impending releases of hazardous substances that may endanger public health or the environment.

CERCLA also enabled the revision of the National Contingency Plan (NCP) which provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also established the National Priorities List, which identifies hazardous waste sites eligible for long-term remedial action financed under the federal Superfund program.

Prevention of Accidental Releases and Risk Management Programs: Requirements pertaining to the prevention of accidental releases are promulgated in Section 112 (r) of the Clean Air Act Amendments of 1990 [42 U.S.C. 7401 et. Seq.]. The objective of these requirements was to prevent the accidental release and to minimize the consequences of any such release of a hazardous substance. Under these provisions, facilities that produce, process, handle or store hazardous substance have a duty to: 1) identify hazards which may result from releases using hazard assessment techniques; 2) design and maintain a safe facility and take steps necessary to prevent releases; and, 3) minimize the consequence of accidental releases that occur.

In accordance with the requirements in Section 112 (r), U.S. EPA adopted implementing guidelines in 40 CFR Part 68. Under this part, stationary sources with more than a threshold quantity of a regulated substance shall be evaluated to determine the potential for and impacts of accidental releases from any processes subject to the federal risk management requirements. Under certain conditions, the owner or operator of a stationary source may be required to develop and submit a Risk Management Plan (RMP). RMPs consist of three main elements: a hazard assessment that includes off-site consequences analyses and a five-year accident history, a prevention program, and an emergency response program.

3.4.2.2.5 Hazardous Material Worker Safety Requirements

Occupational Safety and Health Administration Act: The federal Occupational Safety and Health Administration (OSHA) is an agency of the United States Department of Labor that was created by Congress under the Occupational Safety and Health Act in 1970. OSHA is the agency responsible for assuring worker safety in the handling and use of chemicals in the workplace. Under the authority of the Occupational Safety and Health Act of 1970, OSHA has adopted numerous regulations pertaining to worker safety (see 29 CFR Part 1910). These regulations set standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries. Some OSHA regulations contain standards relating to hazardous materials handling to protect workers who handle toxic, flammable, reactive, or explosive materials, including workplace conditions, employee protection requirements, first aid, and fire protection, as well as material handling and storage. For example, facilities which use, store, manufacture, handle, process, or move hazardous materials are required to conduct employee safety training, have available and know how to use safety equipment, prepare illness prevention programs, provide hazardous substance exposure warnings, prepare emergency response plans, and prepare a fire prevention plan.

Subpart H is a pertinent section of 29 CFR Part 1910 which includes procedures and standards for safe handling, storage, operation, remediation, and emergency response activities involving hazardous materials and waste. Some key subsections in Subpart H include §1910.106 (Flammable and Combustible Liquids) and §1910.120 (Hazardous Waste

Operations and Emergency Response). The Hazardous Waste Operations and Emergency Response regulations contain requirements for worker training programs, medical surveillance for workers engaging in the handling of hazardous materials or wastes, and waste site emergency and remediation planning, for those who are engaged in specific clean-up, corrective action, hazardous material handling, and emergency response activities (see 29 CFR §1910.120 (a)(1)(i-v) and §1926.65 (a)(1)(i-v)).

Process Safety Management: As part of the numerous regulations pertaining to worker safety adopted by OSHA, specific requirements that pertain to Process Safety Management (PSM) of Highly Hazardous Chemicals were adopted in 29 CFR Part 1910.119 and 8 CCR §5189 to protect workers at facilities that have toxic, flammable, reactive or explosive materials. PSM program elements are aimed at preventing or minimizing the consequences of catastrophic releases of chemicals and include process hazard analyses, formal training programs for employees and contractors, investigation of equipment mechanical integrity, and an emergency response plan. Specifically, the PSM program requires facilities that use, store, manufacture, handle, process, or move hazardous materials to conduct employee safety training; have an inventory of safety equipment relevant to potential hazards; have knowledge on use of the safety equipment; prepare an illness prevention program; provide hazardous substance exposure warnings; prepare an emergency response plan; and prepare a fire prevention plan.

Emergency Action Plan: An Emergency Action Plan (EAP) is a written document required by OSHA standards promulgated in 29 CFR 1910.38 (a) to facilitate and organize a safe employer and employee response during workplace emergencies. An EAP is required by all that are required to have fire extinguishers. At a minimum, an EAP must include the following: 1) a means of reporting fires and other emergencies; 2) evacuation procedures and emergency escape route assignments; 3) procedures to be followed by employees who remain to operate critical plant operations before they evacuate; 4) procedures to account for all employees after an emergency evacuation has been completed; 5) rescue and medical duties for those employees who are to perform them; and, 6) names or job titles of persons who can be contacted for further information or explanation of duties under the plan.

National Fire Regulations: The National Fire Codes (NFC), Title 45, published by the National Fire Protection Association (NFPA) contains standards for laboratories using chemicals, which are not requirements, but are generally employed by organizations in order to protect workers. These standards provide basic protection of life and property in laboratory work areas through prevention and control of fires and explosions, and also serve to protect personnel from exposure to non-fire health hazards.

In addition to the NFC, the NFPA adopted a hazard rating system (e.g., NFPA 704). NFPA 704 is a "standard (that) provides a readily recognized, easily understood system for identifying specific hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative hazards of a material. It addresses the health, flammability, instability, and related hazards that may be presented as short-term, acute exposures that are most likely to occur as a result of fire, spill, or similar emergency[1]." In

1 NFPA, FAQ for Standard 704. http://www.nfpa.org/faq.asp?categoryID=928&cookie%5Ftest=1#23057

addition, the hazard ratings per NFPA 704 are used by emergency personnel to quickly and easily identify the risks posed by nearby hazardous materials in order to help determine what, if any, specialty equipment should be used, procedures followed, or precautions taken during the first moments of an emergency response. The scale is divided into four color-coded categories, with blue indicating level of health hazard, red indicating the flammability hazard, yellow indicating the chemical reactivity, and white containing special codes for unique hazards such as corrosivity and radioactivity. Each hazard category is rated on a scale from 0 (no hazard; normal substance) to 4 (extreme risk). Table 3.4-1 summarizes what the codes mean for each hazards category.

TABLE 3.4-1

NFPA 704 Hazards Rating Codes

Hazard Rating Code	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
4 = Extreme	Very short exposure could cause death or major residual injury (extreme hazard)	Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Flash point below 73 °F.	Readily capable of detonation or explosive decomposition at normal temperatures and pressures.	**~~W~~** = Reacts with water in an unusual or dangerous manner.
3 = High	Short exposure could cause serious temporary or moderate residual injury	Liquids and solids that can be ignited under almost all ambient temperature conditions. Flash point between 73 °F and 100 °F.	Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked.	**OXY** = Oxidizer
2 = Moderate	Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.	Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur. Flash point between 100 °F and 200 °F.	Undergoes violent chemical change at elevated temperatures and pressures, reacts violently with water, or may form explosive mixtures with water.	**SA** = Simple asphyxiant gas (includes nitrogen, helium, neon, argon, krypton and xenon).
1 = Slight	Exposure would cause irritation with only minor residual injury.	Must be heated before ignition can occur. Flash point over 200 °F.	Normally stable, but can become unstable at elevated temperatures and pressures	

TABLE 3.4-1 (Concluded)

NFPA 704 Hazards Rating Codes

Hazard Rating Code	Health (Blue)	Flammability (Red)	Reactivity (Yellow)	Special (White)
0 = Insignificant	Poses no health hazard, no precautions necessary	Will not burn	Normally stable, even under fire exposure conditions, and is not reactive with water.	

In addition to the above information, there are also a number of other physical or chemical properties may cause a substance to be a fire hazard. With respect to determining whether any substance is classified as a fire hazard, MSDS lists the National Fire Protection Association 704 flammability hazard ratings (e.g., NFPA 704). NFPA 704 is a "standard (that) provides a readily recognized, easily understood system for identifying flammability hazards and their severity using spatial, visual, and numerical methods to describe in simple terms the relative flammability hazards of a material2."

Although substances can have the same NFPA 704 Flammability Ratings Code, other factors can make each substance's fire hazard very different from each other. For this reason, additional chemical characteristics, such as auto-ignition temperature, boiling point, evaporation rate, flash point, lower explosive limit (LEL), upper explosive limit (UEL), and vapor pressure, are also considered when determining whether a substance is fire hazard. The following is a brief description of each of these chemical characteristics.

Auto-ignition Temperature: The auto-ignition temperature of a substance is the lowest temperature at which it will spontaneously ignite in a normal atmosphere without an external source of ignition, such as a flame or spark.

Boiling Point: The boiling point of a substance is the temperature at which the vapor pressure of the liquid equals the environmental pressure surrounding the liquid. Boiling is a process in which molecules anywhere in the liquid escape, resulting in the formation of vapor bubbles within the liquid.

Evaporation Rate: Evaporation rate is the rate at which a material will vaporize (evaporate, change from liquid to a vapor) compared to the rate of vaporization of a specific known material. This quantity is a represented as a unitless ratio. For example, a substance with a high evaporation rate will readily form a vapor which can be inhaled or explode, and thus have a higher hazard risk. Evaporation rates generally have an inverse relationship to boiling points (i.e., the higher the boiling point, the lower the rate of evaporation).

Flash Point: Flash point is the lowest temperature at which a volatile liquid can vaporize to form an ignitable mixture in air. Measuring a liquid's flash point requires an ignition source. At the flash point, the vapor may cease to burn when the source of ignition is

[2] National Fire Protection Association, FAQ for Standard 704. http://www.nfpa.org/faq.asp?categoryID=928&cookie%5Ftest=1#23057.

removed. There are different methods that can be used to determine the flashpoint of a solvent but the most frequently used method is the Tagliabue Closed Cup standard (ASTM D56), also known as the TCC. The flashpoint is determined by a TCC laboratory device which is used to determine the flash point of mobile petroleum liquids with flash point temperatures below 175 degrees Fahrenheit (79.4 degrees Centigrade).

Flash point is a particularly important measure of the fire hazard of a substance. For example, the Consumer Products Safety Commission (CPSC) promulgated Labeling and Banning Requirements for Chemicals and Other Hazardous Substances in 15 U.S.C. §1261 and 16 CFR Part 1500. Per the CPSC, the flammability of a product is defined in 16 CFR Part 1500.3 (c)(6) and is based on flash point. For example, a liquid needs to be labeled as: 1) “Extremely Flammable” if the flash point is below 20 degrees Fahrenheit; 2) “Flammable” if the flash point is above 20 degrees Fahrenheit but less than 100 degrees Fahrenheit; or, 3) “Combustible” if the flash point is above 100 degrees Fahrenheit up to and including 150 degrees Fahrenheit.

Lower Explosive Limit (LEL): The lower explosive limit of a gas or a vapor is the limiting concentration (in air) that is needed for the gas to ignite and explode or the lowest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). If the concentration of a substance in air is below the LEL, there is not enough fuel to continue an explosion. In other words, concentrations lower than the LEL are "too lean" to burn. For example, methane gas has a LEL of 4.4 percent (at 138 degrees Centigrade) by volume, meaning 4.4 percent of the total volume of the air consists of methane. At 20 degrees Centigrade, the LEL for methane is 5.1 percent by volume. If the atmosphere has less that 5.1 percent methane, an explosion cannot occur even if a source of ignition is present. When the concentration of methane reaches 5.1 percent, an explosion can occur if there is an ignition source.

Upper Explosive Limit (UEL): The upper explosive limit of a gas or a vapor is the highest concentration (percentage) of a gas or a vapor in air capable of producing a flash of fire in presence of an ignition source (e.g., arc, flame, or heat). Concentrations of a substance in air above the UEL are "too rich" to burn.

Vapor Pressure: Vapor pressure is an indicator of a chemical’s tendency to evaporate into gaseous form.

Health Hazards Guidance: In addition to fire impacts, health hazards can also be generated due to exposure of chemicals present in both conventional as well as reformulated products. Using available toxicological information to evaluate potential human health impacts associated with conventional solvents and potential replacement solvents, the toxicity of the conventional solvents can be compared to solvents expected to be used in reformulated products. As a measure of a chemical’s potential health hazards, the following values need to be considered: the Threshold Limit Values (TLVs) established by the American Conference of Governmental Industrial Hygiene (ACGIH), OSHA’s Permissible Exposure Limits (PELs), the Immediately Dangerous to Life and Health (IDLH) levels recommended by the National Institute for Occupational Safety and Health (NIOSH), permissible exposure limits (PEL) established by OSHA, and health hazards developed by the National Safety Council. The following is a brief description of each of these values.

Threshold Limit Values (TLVs): The TLV of a chemical substance is a level to which it is believed a worker can be exposed day after day for a working lifetime without adverse health effects. The TLV is an estimate based on the known toxicity in humans or animals of a given chemical substance, and the reliability and accuracy of the latest sampling and analytical methods. The TLV for chemical substances is defined as a concentration in air, typically for inhalation or skin exposure. Its units are in parts per million (ppm) for gases and in milligrams per cubic meter (mg/m^3) for particulates. The TLV is a recommended guideline by ACGIH.

Permissible Exposure Limits (PEL): The PEL is a legal limit, usually expressed in ppm, established by OSHA to protect workers against the health effects of exposure to hazardous substances. PELs are regulatory limits on the amount or concentration of a substance in the air. A PEL is usually given as a time-weighted average (TWA), although some are short-term exposure limits (STEL) or ceiling limits. A TWA is the average exposure over a specified period of time, usually eight hours. This means that, for limited periods, a worker may be exposed to concentrations higher than the PEL, so long as the average concentration over eight hours remains lower. A short-term exposure limit is one that addresses the average exposure over a 15 to 30 minute period of maximum exposure during a single work shift. A ceiling limit is one that may not be exceeded for any period of time, and is applied to irritants and other materials that have immediate effects. The OSHA PELs are published in 29 CFR 1910.1000 Table Z1.

Immediately Dangerous to Life and Health (IDLH): IDLH is an acronym defined by NIOSH as exposure to airborne contaminants that is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment." IDLH values are often used to guide the selection of breathing apparatus that are made available to workers or firefighters in specific situations.

3.4.2.2.6 Oil and Pipeline Regulations and Oversight

Oil Pollution Act: The Oil Pollution Act was signed into law in 1990 to give the federal government authority to better respond to oil spills (see 33 U.S.C. §2701). The Oil Pollution Act improved the federal government's ability to prevent and respond to oil spills, including provision of money and resources. The Oil Pollution Act establishes polluter liability, gives states enforcement rights in navigable waters of the State, mandates the development of spill control and response plans for all vessels and facilities, increases fines and enforcement mechanisms, and establishes a federal trust fund for financing clean-up.

The Oil Pollution Act also establishes the National Oil Spill Liability Trust Fund to provide financing for cases in which the responsible party is either not readily identifiable, or refuses to pay the cleanup/damage costs. In addition, the Oil Pollution Act expands provisions of the National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan, requiring the federal government to direct all public and private oil spill response efforts. It also requires area committees, composed of federal, state, and local government officials, to develop detailed, location-specific area contingency plans. In addition, the Oil Pollution Act directs owners and operators of vessels, and certain facilities that pose a serious threat to the environment, to prepare their own specific facility response plans. The Oil Pollution Act increases penalties for regulatory non-compliance by responsible parties; gives the federal government broad enforcement authority; and provides individual states the authority to establish their own laws governing oil spills, prevention measures, and response methods. The Oil Pollution Act requires oil storage facilities and vessels to submit to the Federal government plans detailing how they will respond to large discharges. The U.S. EPA has published regulations for aboveground storage facilities and the Coast Guard has done the same for oil tankers.

Oil Pollution Prevention Regulation: In 1973, EPA issued the Oil Pollution Prevention regulation (see 40 CFR 112**),** to address the oil spill prevention provisions contained in the Clean Water Act of 1972. The Spill Prevention, Control, and Countermeasure (SPCC) Rule is part of the Oil Pollution Prevention regulations (see Subparts A through C of 40 CFR Part 112). Specifically, the SPCC rule includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires specific facilities to prepare, amend, and implement SPCC Plans. SPCC Plans require applicable facilities to take steps to prevent oil spills including: 1) using suitable storage containers/tanks; 2) providing overfill prevention (e.g., high-level alarms); 3) providing secondary containment for bulk storage tanks; 4) providing secondary containment to catch oil spills during transfer activities; and, 5) periodically inspecting and testing pipes and containers.

U.S. Department of Transportation, Office of Pipeline Safety: The Office of Pipeline Safety, within the U.S. DOT, Pipeline and Hazards Material Safety Administration, has jurisdictional responsibility for developing regulations and standards to ensure the safe and secure movement of hazardous liquid and gas pipelines under its jurisdiction in the United States. The Office of Pipeline Safety has the following key responsibilities:

- Support the operation of, and coordinate with the United States Coast Guard on the National Response Center and serve as a liaison with the Department of Homeland Security and the Federal Emergency Management Agency on matters involving pipeline safety;

- Develop and maintain partnerships with other federal, state, and local agencies, public interest groups, tribal governments, and the regulated industry and other underground utilities to address threats to pipeline integrity, service, and reliability and to share responsibility for the safety of communities;

- Administer pipeline safety regulatory programs and develops regulatory policy involving pipeline safety;

- Oversee pipeline operator implementation of risk management and risk-based programs and administer a national pipeline inspection and enforcement program;

- Provide technical and resource assistance for state pipeline safety programs to ensure oversight of intrastate pipeline systems and educational programs at the local level; and,

- Support the development and conduct of pipeline safety training programs for federal and state regulatory and compliance staff and the pipeline industry.

49 CFR Parts 178 – 185 relates to the role of transportation, including pipelines, in the United States. 49 CFR Parts 186-199 establishes minimum pipeline safety standards. The Office of the State Fire Marshal works in partnership with the Federal Pipeline and Hazardous Materials Safety Administration to assure pipeline operators are meeting requirements for safe, reliable, and environmentally sound operation of their facilities for intrastate pipelines within California.

Chemical Facility Anti-Terrorism Standards: The Federal Department of Homeland Security is responsible for implementing the Chemical Facility Anti-Terrorism Standards that were adopted in 2007 (see 6 CFR Part 27). These standards establish risk-based performance standards for the security of chemical facilities and require covered chemical facilities to prepare Security Vulnerability Assessments, which identify facility security vulnerabilities, and to develop and implement Site Security Plans.

3.4.2.3 State Regulations

3.4.2.3.1 Hazardous Materials and Waste Regulations

Hazardous Waste Control Law: California's Hazardous Waste Control Law is administered by the California Environmental Protection Agency (CalEPA) to regulate hazardous wastes within the State of California. While the California Hazardous Waste Control Law is generally more stringent than RCRA, both the state and federal laws apply in California. The California Department of Toxic Substances Control (DTSC) is the primary agency in charge of enforcing both the federal and state hazardous materials laws in California. The DTSC regulates hazardous waste, oversees the cleanup of existing contamination, and pursues avenues to reduce hazardous waste produced in California. The DTSC regulates hazardous waste in California under the authority of RCRA, the Hazardous Waste Control Law, and the California Health and Safety Code. Under the direction of the CalEPA, the DTSC maintains the Cortese and Envirostor databases of hazardous materials and waste sites as specified under Government Code §65962.5.

The Hazardous Waste Control Law (22 CCR Chapter 11, Appendix X) also lists 791 chemicals and approximately 300 common materials which may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

California Occupational Safety and Health Administration: The California Occupational Safety and Health Administration (CalOSHA) is the primary state agency responsible for worker safety in the handling and use of chemicals in the workplace.

CalOSHA requires employers to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings. CalOSHA's standards are generally more stringent than federal regulations.

Hazardous Materials Release Notification: Many state statutes require emergency notification when a hazardous chemical is released, including:

- California Health and Safety Code §25270.7, §25270.8, and §25507;
- California Vehicle Code §23112.5;
- California Public Utilities Code §7673 (General Orders #22-B, 161);
- California Government Code §51018 and §8670.25.5 (a);
- California Water Code §13271 and §13272; and,
- California Labor Code §6409.1 (b)10.

California Accident Release Prevention (CalARP) Program: The California Accident Release Prevention Program (19 CCR Division 2, Chapter 4.5) requires the preparation of Risk Management Plans (RMPs). CalARP requires stationary sources with more than a threshold quantity of a regulated substance to be evaluated to determine the potential for and impacts of accidental releases from any processes subject to state risk management requirements. RMPs are documents prepared by the owner or operator of a stationary source containing detailed information including: 1) regulated substances held onsite at the stationary source; 2) offsite consequences of an accidental release of a regulated substance; 3) the accident history at the stationary source; 4) the emergency response program for the stationary source; 5) coordination with local emergency responders; 6) hazard review or process hazard analysis; 7) operating procedures at the stationary source; 8) training of the stationary source's personnel; 9) maintenance and mechanical integrity of the stationary source's physical plant; and, 10) incident investigation. The CalARP program is implemented at the local government level by Certified Unified Program Agencies (CUPAs) also known as Administering Agencies (AAs). Typically, local fire departments are the administering agencies of the CalARP program because they frequently are the first responders in the event of a release.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program: The Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) as promulgated by CalEPA in Title 27 CCR Chapter 6.11 requires the administrative consolidation of six hazardous materials and waste programs (program elements) under one agency, a CUPA. The Unified Program administered by the State of California consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities for the state's environmental and emergency management programs, which include Hazardous Waste

Generator and On-Site Hazardous Waste Treatment Programs ("Tiered Permitting"); Above ground SPCC Program; Hazardous Materials Release Response Plans and Inventories (business plans); the CalARP Program; the UST Program; and the Uniform Fire Code Plans and Inventory Requirements. The Unified Program is implemented at the local government level by CUPAs.

Hazardous Materials Management Act: The State of California (California Health and Safety Code Division 20, Chapter 6.95) requires any business handling more than a specified amount of hazardous or extremely hazardous materials, termed a "reportable quantity," to submit a Hazardous Materials Business Plan to its CUPA. Business plans must include an inventory of the types, quantities, and locations of hazardous materials at the facility. Businesses are required to update their business plans at least once every three years and the chemical portion of their plans every year. Also, business plans must include emergency response plans and procedures to be used in the event of a significant or threatened significant release of a hazardous material. These plans need to identify the procedures to follow for immediate notification to all appropriate agencies and personnel of a release, identification of local emergency medical assistance appropriate for potential accident scenarios, contact information for all company emergency coordinators, a listing and location of emergency equipment at the business, an evacuation plan, and a training program for business personnel. The requirements for hazardous materials business plans are specified in the California Health and Safety Code and 19 CCR.

Hazardous Materials Transportation in California: California regulates the transportation of hazardous waste originating or passing through the State in Title 13, CCR. The California Highway Patrol (CHP) and Caltrans have primary responsibility for enforcing federal and State regulations and responding to hazardous materials transportation emergencies. The CHP enforces materials and hazardous waste labeling and packing regulations that prevent leakage and spills of material in transit and provide detailed information to cleanup crews in the event of an incident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are all part of the responsibility of the CHP. Caltrans has emergency chemical spill identification teams at locations throughout California.

California Fire Code: While NFC Standard 45 and NFPA 704 are regarded as nationally recognized standards, the California Fire Code (24 CCR) also contains state standards for the use and storage of hazardous materials and special standards for buildings where hazardous materials are found. Some of these regulations consist of amendments to NFC Standard 45. State Fire Code regulations require emergency pre-fire plans to include training programs in first aid, the use of fire equipment, and methods of evacuation.

3.4.2.4 Local Regulations

SCAQMD Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil: SCAQMD Rule 1166 establishes requirements to control the emission of VOCs from excavating, grading, handling, and treating soil contaminated from leakage, spillage, or other means of VOCs deposition. Rule 1166 stipulates that any parties planning on excavating, grading, handling, transporting, or treating soils contaminated with VOCs must first apply for and obtain, and operate pursuant to, a mitigation plan approved by the Executive Officer prior to commencement of operation. BACT is required during all phases of remediation of soil contaminated with VOCs. Rule 1166 also sets forth testing, record keeping and reporting procedures that must be followed at all times. Non-compliance with Rule 1166 can result in the revocation of the approved mitigation plan, the owner and/or the operator being served with a Notice of Violation for creating a public nuisance, or an order to halt the offending operation until the public nuisance is mitigated to the satisfaction of the Executive Officer.

Other Local Agencies: In addition to the SCAQMD, other local agencies throughout the four counties in the district and their respective fire departments have a variety of local laws that regulate reporting, storage and handling of hazardous materials and wastes.

Los Angeles County: The Office of Emergency Management is responsible for organizing and directing the preparedness efforts of the Emergency Management Organization of Los Angeles County. Los Angeles County's policies towards hazardous materials management include enforcing stringent site investigations for factors related to hazards; limiting the development in high hazard areas, such as floodplains, high fire hazard areas, and seismic hazard zones; facilitating safe transportation, use, and storage of hazardous materials; supporting lead paint abatement; remediating brownfield sites; encouraging the purchase of homes on the FEMA Repeat Hazard list and designating the land as open space; enforcing restrictions on access to important energy sites; limiting development downslope from aqueducts; promoting safe alternatives to chemical-based products in households; and prohibiting development in floodways. The county has defined effective emergency response management capabilities to include supporting county emergency providers with reaching their response time goals; promoting the participation and coordination of emergency response management between cities and other counties at all levels of government; coordinating with other county and public agency emergency planning and response activities; and encouraging the development of an early warning system for tsunamis, floods and wildfires.

The County of Los Angeles Fire Department, Fire Prevention Guide #9 regulates spray application of flammable or combustible liquids. The guide requires no open flame, spark-producing equipment or exposed surfaces exceeding the ignition temperature of the material being sprayed within the area. For open spraying, as would be the case for the field application of the acetone-based coatings, no spark-producing equipment or open flame shall be within 20 feet horizontally and 10 feet vertically of the spray area. Anyone not complying with these guidelines would be in violation of the current fire codes. The fire department also limits the residential storage of flammable liquids to five gallons and recommends storage in a cool place. If the flammable coating container will be exposed to direct sunlight or heat, storage in cool water is recommended. Finally, all metal containers involving the transfer of five gallons or more should be grounded and bonded.

Orange County: The regulatory agency responsible for enforcement, as well as inspection of pipelines transporting hazardous materials, is the California State Fire Marshal's Office, Hazardous Liquid Pipeline Division. The Orange County Health Care Agency (OCHCA) has been designated by the Board of Supervisors as the agency to enforce the UST program.

The OCHCA UST Program regulates approximately 7,000 of the 9,500 underground tanks in Orange County. The program includes conducting regular inspections of underground tanks; oversight of new tank installations; issuance of permits; regulation of repair and closure of tanks; ensuring the mitigation of leaking USTs; pursuing enforcement action; and educating and assisting the industries and general public as to the laws and regulations governing USTs.

Under mandate from the California Health and Safety Code, the Orange County Fire Authority is the designated agency to inventory the distribution of hazardous materials in commercial or industrial occupancies, develop and implement emergency plans, and require businesses that handle hazardous materials to develop emergency plans do deal with these materials.

Orange County's Hazardous Materials Program Office is responsible for facilitating the coordination of various parts of the County's hazardous materials program; assisting in coordinating County hazardous materials activities with outside agencies and organization; providing comprehensive, coordinated analysis of hazardous materials issues; and directing the preparation, implementation, and modification of the county's Hazardous Waste Management Plan. With regard to San Onofre Nuclear Generating Station, in an effort to prepare those who live and work in areas outside, but adjacent to SONGS, the federal and state governments have established three levels of emergency zones. Orange County is responsible for its own emergency plans concerning a nuclear power plant accident, and the Incident Response Plan is updated regularly.

San Bernardino County: San Bernardino County's Hazardous Waste Management Plan (HWMP) serves as the primary planning document for the management of hazardous waste in San Bernardino County. The HWMP identifies the types and amounts of wastes generated; establishes programs for managing these wastes; identifies an application review process for the siting of specified hazardous waste facilities; identifies mechanisms for reducing the amount of waste generated; and identifies goals, policies, and actions for achieving effective hazardous waste management. One of the county's stated goals is to minimize the generation of hazardous waste and reduce the risk posed by storage, handling, transportation, and disposal of hazardous wastes. In addition, the county will protect its residents and visitors from injury and loss of life and protect property from fires by deploying firefighters and requiring new land developments to prepare site-specific fire protection plans.

Riverside County: Through its membership in the Southern California Hazardous Waste Management Authority (SCHWMA), the County of Riverside has agreed to work on a regional level to solve problems involving hazardous waste. SCHWMA was formed through a joint powers agreement between Santa Barbara, Ventura, San Bernardino, Orange, San Diego, Imperial, and Riverside Counties and the Cities of Los Angeles and San Diego. Working within the concept of "fair share," each SCHWMA county has agreed to take responsibility for the treatment and disposal of hazardous waste in an amount that is at least equal to the amount generated within that county. This responsibility can be met by siting hazardous waste management facilities (transfer, treatment, and/or repository) capable of processing an amount of waste equal to or larger than the amount generated within the county, or by creating intergovernmental agreements between counties to provide compensation to a county for taking another county's waste, or through a combination of both facility siting and intergovernmental agreements. When and where a facility is to be sited is primarily a function of the private market. However, once an application to site a facility has been received, the county will review the requested facility and its location against a set of established siting criteria to ensure that the location is appropriate and may deny the application based on the findings of this review. The County of Riverside does not presently have any of these facilities within its jurisdiction and, therefore, must rely on intergovernmental agreements to fulfill its fair share responsibility to SCHWMA.

3.4.3 Emergency Response To Hazardous Materials And Waste Incidents

The California Emergency Management Agency (CalEMA) exists to enhance safety and preparedness in California through strong leadership, collaboration, and meaningful partnerships. The goal of CalEMA is to protect lives and property by effectively preparing for, preventing, responding to, and recovering from all threats, crimes, hazards, and emergencies. CalEMA under the Fire and Rescue Division coordinates statewide implementation of hazardous materials accident prevention and emergency response programs for all types of hazardous materials incidents and threats. In response to any hazardous materials emergency, CalEMA is called upon to provide state and local emergency managers with emergency coordination and technical assistance.

Pursuant to the Emergency Services Act, the State of California has developed an Emergency Response Plan to coordinate emergency services provided by federal, state, and local government agencies and private persons. Response to hazardous materials incidents is one part of this plan. The Plan is administered by CalEMA which coordinates the responses of other agencies. Six mutual aid and Local Emergency Planning Committee (LEPC) regions have been identified for California that are divided into three areas of the state designated as the Coastal (Region II, which includes 16 counties with 151 incorporated cities and a population of about eight million people.), Inland (Region III, Region IV and Region V, which includes 31 counties with 123 incorporated cities and a population of about seven million people), and Southern (Region I and Region VI, which includes 11 counties with 226 incorporated cities and a population of about 21.6 million people). The SCAQMD jurisdiction covers portions of Region I and Region VI.

In addition, pursuant to the Hazardous Materials Release Response Plans and Inventory Law of 1985, local agencies are required to develop "area plans" for response to releases of hazardous materials and wastes. These emergency response plans depend to a large extent on the business plans submitted by persons who handle hazardous materials. An area plan must include pre-emergency planning of procedures for emergency response, notification, coordination of affected government agencies and responsible parties, training, and follow-up.

3.4.4 Hazardous Materials Incidents

Hazardous materials move through southern California by a variety of modes including truck, rail, air, ship, and pipeline. The movement of hazardous materials implies a degree of risk, depending on the materials being moved, the mode of transport, and numerous other factors (e.g., weather).

Hazardous materials move through the region by a variety of modes: Truck, rail, air, ship, and pipeline. According to the Office of Hazardous Materials Safety (OHMS) in the U.S. Department of Transportation, hazardous materials shipments can be regarded as equivalent to deliveries, but any given shipment may involve one or more movements or trip segments, that may occur by different routes (e.g., rail transport with final delivery by truck). According to the Commodity Flow Survey data (U.S. DOT, 2010), there were approximately 2.3 billion tons of hazardous materials shipments in the United States in 2007. Table 3.4-2 indicates that trucks move more than 50 percent of total hazardous materials shipped via all transportation modes from a location in the United States. By contrast, rail accounts of only six percent of total shipments of hazardous materials (U.S. DOT, 2010).

TABLE 3.4-2

Hazardous Material Shipments in the United States

Mode	Total Commercial Freight (thousand tons)	Hazardous Materials Shipped (thousand tons)	Percent of Hazardous Materials Shipped
Truck	8,778,713	1,202,825	13.7%
Rail	1,861,307	129,743	7.0%
Water	403,639	149,794	37.1%
Pipeline	650,859	628,905	96.6%
TOTAL	11,694,518	2,111,267	18.1%

Source: U.S. DOT, 2010.

The movement of hazardous materials through the U.S. transportation system represents almost 18 percent of total tonnage for all freight shipments as measured by the Commodity Flow Survey. The total commercial freight moved in 2007 in California by all transportation modes was 900,817 thousand tons, of which about 738,550 thousand tons were moved by truck (U.S. DOT, 2010).

The California Hazardous Materials Incident Reporting System (CHMIRS) is a post-incident reporting system to collect data on incidents involving the accidental release of hazardous materials in California. Information on accidental releases of hazardous materials are reported to and maintained by CalEMA. While information on accidental releases are reported to CalEMA, according to discussions with Mr. Greg Renick of Cal-EMA on July 25, 2012, CalEMA no longer conducts statistical evaluations of the releases (e.g., total number of releases per year) for the entire State, or data by county. The U.S. DOT Pipeline and Hazardous Materials Safety Administration provides access to retrieve data from the Incident Reports Database, which also includes non-pipeline incidents (e.g., truck and rail events). Incident data and summary statistics (e.g., release date, geographical location for state and county) and type of material released, are available online from the Hazardous Materials Incident Report Form 5800.1.

Table 3.4-3 provides a summary of the reported hazardous material incidents for Los Angeles, Orange, Riverside, and San Bernardino counties for 2010 and 2011 from the Hazardous Materials Incident Report Form 5800.1. Data presented is for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

In 2010, there were a total of 672 incidents reported for Los Angeles, Orange, Riverside and San Bernardino counties, and in 2011 a total of 698 incidents four these four counties. San Bernardino and Los Angeles counties accounted for the largest number of incidents, followed by Orange and Riverside counties.

TABLE 3.4-3

Reported Hazardous Materials Incidents for 2010 and 2011

County	2010	2011
Los Angles	273	256
Orange	71	93
Riverside	46	51
San Bernardino	282	298
Total	672	698

3.4.5 Hazards Associated With Air Pollution Control, Coating Reformulations and Alternative Fuels

The SCAQMD has evaluated the hazards associated with previous AQMPs, proposed SCAQMD rules, and non-SCAQMD projects where the SCAQMD is the Lead Agency pursuant to CEQA. The analyses covered a range of potential air pollution control technologies and equipment. EIRs prepared for the previous AQMPs have specifically evaluated hazard impacts from: 1) add-on control equipment; 2) alternative coating methods; and, 3) alternative fuels.

Add-on pollution control technologies which have been previously analyzed for hazards include: carbon adsorption, incineration, post-combustion flue-gas treatment, SCR and selective non-catalytic reduction (SNCR), scrubbers, bag filters, and electrostatic precipitators. The use of add-on pollution control equipment may concentrate or utilize hazardous materials. A malfunction or accident when using add-on pollution control equipment could potentially expose people to hazardous materials, explosions, or fires. The SCAQMD has determined that the transport, use, and storage of ammonia, both aqueous and anhydrous, (used in SCR and SNCR systems) may have significant hazard impacts in the event of an accidental release. Further analyses have indicated that the use of aqueous ammonia (instead of anhydrous ammonia) can usually reduce the hazards associated with ammonia use in SCR and SNCR systems to less than significant.

The potential hazards associated with alternative coating reformulations have been analyzed including powder coatings, radiation-curable coatings, high solids coatings, and waterborne coatings. The greatest hazard associated with both current and alternative coating reformulations is flammability.

Alternative fuels may be used to reduce emissions from both stationary source equipment and motor vehicles. The alternative fuels which have been analyzed include reformulated gasoline, methanol, compressed natural gas, LPG or propane, and electrically charged batteries. Like conventional fossil fuels, alternative fuels may create fire hazards, explosions or accidental releases during fuel transport, storage, dispensing, and use. Electric batteries also present a slight fire and explosion hazards due to the presence of reactive compounds, which may be subjected to high temperatures.

Ammonia

Ammonia is the primary hazardous chemical identified with the use of air pollution control equipment (e.g., SCR and SNCR systems). Ammonia, though not a carcinogen, can have chronic and acute health impacts. Therefore, a potential increase in the use of ammonia may increase the current existing risk setting associated with deliveries (e.g., truck and road accidents) and onsite or offsite spills for each facility that currently uses or will begin to use ammonia. Exposure to a toxic gas cloud is the potential hazard associated with this type of control equipment. A toxic gas cloud is the release of a volatile chemical such as anhydrous ammonia that could form a cloud that migrates off-site, thus exposing individuals. Anhydrous ammonia is heavier than air such that when released into the atmosphere, would form a cloud at ground level rather than be dispersed "Worst-case" conditions tend to arise when very low wind speeds coincide with the accidental release, which can allow the chemicals to accumulate rather than disperse. Though there are facilities that may be affected by the proposed 2012 AQMP control measures that are currently permitted to use anhydrous ammonia, for new construction, however, current SCAQMD policy no longer allows the use of anhydrous ammonia. Instead, to minimize the hazards associated with ammonia used in the SCR or SNCR process, aqueous ammonia, 19 percent by volume, is typically required as a permit condition associated with the installation of SCR or SNCR equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and, 2) 19 percent aqueous ammonia is not on any acutely hazardous material lists unlike anhydrous ammonia or aqueous ammonia at higher percentages.

LNG

LNG is essentially no different from the natural gas used in homes and businesses everyday, except that it has been refrigerated to minus 259 degrees Fahrenheit at which point it becomes a clear, colorless, and odorless liquid. LNG currently is used as a combustion fuel in both stationary and mobile sources. As a liquid, natural gas occupies only one six-hundredth of its gaseous volume and can be transported economically between continents in special tankers. LNG weighs slightly less than half as much as water, so it floats on fresh or sea water. However, when LNG comes in contact with any warmer surface such as water or air, it evaporates very rapidly ("boil"), returning to its original, gaseous volume. As the LNG vaporizes, a vapor cloud resembling ground fog will form under relatively calm atmospheric conditions. The vapor cloud is initially heavier than air since it is so cold, but as it absorbs more heat, it becomes lighter than air, rises, and can be carried away by the wind. An LNG vapor cloud cannot explode in the open atmosphere, but it could burn.

LNG is considered a hazardous material. The primary safety concerns are the potential consequences of an LNG spill. LNG hazards result from three of its properties:

- Cryogenic temperatures
- Dispersion characteristics
- Flammability characteristics

The extreme cold of LNG can directly cause injury or damage. Although momentary contact on the skin can be harmless, extended contact will cause severe freeze burns. On contact with certain metals, such as ship decks, LNG can cause immediate cracking. Although not poisonous, exposure to the center of a vapor cloud could cause asphyxiation due to the absence of oxygen. LNG vapor clouds can ignite within the portion of the cloud where the concentration of natural gas is between a five and a 15 percent (by volume) mixture with air. To catch fire, however, this portion of the vapor cloud must encounter an ignition source. Otherwise, the LNG vapor cloud will simply dissipate into the atmosphere. An ignited LNG vapor cloud is very dangerous, because of its tremendous radiant heat output. Furthermore, as a vapor cloud continues to burn, the flame could burn back toward the evaporating pool of spilled liquid, ultimately burning the quickly evaporating natural gas immediately above the pool, giving the appearance of a "burning pool" or "pool fire." An ignited vapor cloud or a large LNG pool fire can cause extensive damage to life and property.

Spilled LNG would disperse faster on the ocean than on land, because water spills provide very limited opportunity for containment. Furthermore, LNG vaporizes more quickly on water, because the ocean provides an enormous heat source. For these reasons, most analysts conclude that the risks associated with shipping, loading, and off-loading LNG are much greater than those associated with land-based storage facilities. Preventing spills and responding immediately to spills should they occur are major factors in the design of LNG facilities (CEC, 2003).

Beyond routine industrial hazards and safety considerations, LNG presents specific safety considerations. In the event of an accidental release of LNG, the safety zone around a facility protects neighboring communities from personal injury, property damage or fire. The one and only case of an accident that affected the public was in Cleveland, Ohio in 1944. Research stemming from the Cleveland incident has influenced safety standards used today. Indeed, during the past four decades, growth in LNG use worldwide has led to a number of technologies and practices that will be used in the U.S. and elsewhere in North America as the LNG industry expands. Generally, multiple layers of protection create four critical safety conditions, all of which are integrated with a combination of industry standards and regulatory compliance. The four requirements for safety – primary containment, secondary containment, safeguard systems and separation distance apply across the LNG value chain, from production, liquefaction and shipping, to storage and re-gasification. The term "containment" means safe storage and isolation of LNG (Foss, 2003).

LPG

More than 350,000 light-and medium-duty vehicles travel the nation's highways using liquefied petroleum gas (LPG or LP gas), while over 4 million vehicles use it worldwide. LPG is a mixture of several gases that is generally called "propane," in reference to the mixture's chief ingredient. LPG changes to the liquid state at the moderately high pressures found in an LPG vehicle's fuel tank. LPG is formed naturally, interspersed with deposits of petroleum and natural gas. Natural gas contains LPG, water vapor, and other impurities that must be removed before it can be transported in pipelines as a salable product. About 55 percent of the LPG processed in the U.S. is from natural gas purification. The other 45 percent comes from crude oil refining. Since a sizable amount of U.S. LPG is derived from petroleum, LPG does less to relieve the country's dependency on foreign oil than some other alternative fuels. However, because over 90 percent of the LPG used in the United States is produced here, LPG does help address the national security component of the nation's overall petroleum dependency problem.

Propane vehicles emit about one-third fewer reactive organic gases than gasoline-fueled vehicles. Nitrogen oxide and carbon monoxide emissions are also 20 percent and 60 percent less, respectively. Unlike gasoline-fueled vehicles, there are no evaporative emissions while LPG vehicles are running or parked, because LPG fuel systems are tightly sealed. Small amounts of LPG may escape into the atmosphere during refueling, but these vapors are 50 percent less reactive than gasoline vapors, so they have less of a tendency to generate smog-forming ozone. LPG's extremely low sulfur content means that the fuel does not contribute significantly to acid rain.

Many propane vehicles are converted gasoline vehicles. The relatively inexpensive conversion kits include a regulator/vaporizer that changes liquid propane to a gaseous form and an air/fuel mixer that meters and mixes the fuel with filtered intake air before the mixture is drawn into the engine's combustion chambers. Also included in conversion kits is closed-loop feedback circuitry that continually monitors the oxygen content of the exhaust and adjusts the air/fuel ratio as necessary. This device communicates with the vehicle's onboard computer to keep the engine running at optimum efficiency. LPG vehicles additionally require a special fuel tank that is strong enough to withstand the LPG storage pressure of about 130 pounds per square inch. The gaseous nature of the fuel/air mixture in an LPG vehicle's combustion chambers eliminates the cold-start problems associated with liquid fuels. In contrast to gasoline engines, which produce high emission levels while running cold, LPG engine emissions remain similar whether the engine is cold or hot. Also, because LPG enters an engine's combustion chambers as a vapor, it does not strip oil from cylinder walls or dilute the oil when the engine is cold. This helps LPG powered engines to have a longer service life and reduced maintenance costs. Also helping in this regard is the fuel's high hydrogen-to-carbon ratio (C3H8), which enables propane powered vehicles to have less carbon build-up than gasoline- and diesel powered vehicles. LPG delivers roughly the same power, acceleration, and cruising speed characteristics as gasoline. It does yield a somewhat reduced driving range, however, because it contains only about 70-75 percent of the energy content of gasoline. Its high octane rating (around 105) means, though, that an LPG engine's power output and fuel efficiency can be increased beyond what would be possible with a gasoline engine without causing destructive "knocking." Such fine-tuning can help compensate for the fuel's lower energy density. Fleet owners find that propane costs are typically 5 to 30 percent less than those of gasoline. The cost of constructing an LPG fueling station is also similar to that of a comparably sized gasoline dispensing system. Fleet owners not wishing to establish fueling stations of their own may avail themselves of over 3,000 publicly accessible fueling stations nationwide.

Propane is an odorless, nonpoisonous gas that has the lowest flammability range of all alternative fuels. High concentrations of propane can displace oxygen in the air, though, causing the potential for asphyxiation. This problem is mitigated by the presence of ethyl mercaptan, which is an odorant that is added to warn of the presence of gas. While LPG itself does not irritate the skin, the liquefied gas becomes very cold upon escaping from a high-pressure tank, and may therefore cause frostbite, should it contact unprotected skin. As with gasoline, LPG can form explosive mixtures with air. Since the gas is slightly heavier than air, it may form a continuous stream that stretches a considerable distance from a leak or open container, which may lead to a flashback explosion upon contacting a source of ignition (U.S. DOE, 2003).

While LPG is classified as a fire hazard, it is not classified as a toxic or as a hazardous air pollutant. LPG is a regulated substance subject to both the California and Federal RMP programs in accordance with the CCR, Title 19, §2770.4.1 and Chapter 40 of the CFR Part 68, §68.126[3]. A RMP is a document prepared by the owner or operator of a stationary source containing detailed information including, but not limited to:

- Regulated substances held onsite at the stationary source;
- Offsite consequences of an accidental release of a regulated substance;
- The accident history at the stationary source;
- The emergency response program for the stationary source;
- Coordination with local emergency responders;
- Hazard review or process hazard analysis;
- Operating procedures at the stationary source;
- Training of the stationary source's personnel;
- Maintenance and mechanical integrity of the stationary source's physical plant; and
- Incident investigation.

The threshold quantity for LPG (as propane) as a regulated substance for accidental release prevention is 10,000 pounds. However, when LPG is used as a fuel by an end user (as is

3 The federal RMP program is administered in California through the California Accidental Release Prevention (CalARP) program (Health & Safety Code (H&SC), §§ 25531 to 25543.3 and California Code of Regulations, Title 19 (19 CCR or "Title 19"), §§ 2735.1 to 2785.1).

frequently the case with residential portable and stationary storage tanks), or when it is held for retail sale as a fuel, it is excluded from these RMP requirements, even if the amount exceeds the threshold quantity.

On June 1, 2012, SCAQMD adopted Rule 1177 - Liquefied Petroleum Gas Transfer and Dispensing to reduce fugitive VOC emissions released during the transfer and dispensing of LPG at residential, commercial, industrial, chemical, agricultural and retail sales facilities. Rule 1177 applies to the transfer of LPG to and from stationary storage tanks, cylinders and cargo tanks, including bobtails, truck transports and rail tank cars, and into portable refillable cylinders. In addition, Rule 1177 requires the use of low emission fixed liquid level gauges or equivalent alternatives during filling of LPG-containing tanks and cylinders, use of LPG low emission connectors, routine leak checks and repairs of LPG transfer and dispensing equipment, and recordkeeping and reporting to demonstrate compliance.

With respect to suppliers and sellers of LPG, Health and Safety Code §25506 specifically requires all businesses handling hazardous materials to submit a business emergency response plan to assist local administering agencies in the emergency release or threatened release of a hazardous material. Business emergency response plans generally require the following:

1. Identification of individuals who are responsible for various actions, including reporting, assisting emergency response personnel and establishing an emergency response team;

2. Procedures to notify the administering agency, the appropriate local emergency rescue personnel, and the California Office of Emergency Services;

3. Procedures to mitigate a release or threatened release to minimize any potential harm or damage to persons, property or the environment;

4. Procedures to notify the necessary persons who can respond to an emergency within the facility;

5. Details of evacuation plans and procedures;

6. Descriptions of the emergency equipment available in the facility;

7. Identification of local emergency medical assistance; and

8. Training (initial and refresher) programs for employees in:

    a. The safe handling of hazardous materials used by the business;

    b. Methods of working with the local public emergency response agencies;

    c. The use of emergency response resources under control of the handler; and

d. Other procedures and resources that will increase public safety and prevent or mitigate a release of hazardous materials.

In general, every county or city and all facilities using a minimum amount of hazardous materials are required to formulate detailed contingency plans to eliminate, or at least minimize, the possibility and effect of fires, explosion, or spills. In conjunction with the California Office of Emergency Services, local jurisdictions have enacted ordinances that set standards for area and business emergency response plans. These requirements include immediate notification, mitigation of an actual or threatened release of a hazardous material, and evacuation of the emergency area.

Lastly, operators who currently transfer and dispense LPG are well aware of the hazardous nature of LPG, including its flammability and receive periodic training for the safe handling of LPG for the following reasons. Facility operators with a dispensing system for LPG are required to comply with operating pressures pursuant to the standards developed by the American Society of Mechanical Engineers (ASME) Pressure Vessel Code, Section 8; NFPA 58 with regard to venting LPG to the atmosphere; and for LPG tanks that are subject to RMP requirements, the operators must obtain permits from, and submit RMPs to the local Certified Unified Program Agency (CUPA) with is typically the city or county fire department. For similar reasons, industrial and commercial customers on the receiving end of LPG deliveries are also well aware of the safety issues associated with LPG. Residential customers, through warning labels on the portable cylinders and on the units to which the portable cylinders connect, are notified of the flammability dangers associated with LPG.

SUBCHAPTER 3.5

HYDROLOGY AND WATER QUALITY

Regulatory Background

Hydrology

Water Demand and Forecasts

Water Supply

Water Conservation

Water Quality

Wastewater Treatment

3.5 HYDROLOGY AND WATER QUALITY

3.5.1 Regulatory Background

Water resources are regulated by an overlapping network of local, state, federal and international laws and regulations. As a result, the authority to address a given discharge or activity is not always clear. Therefore, the regulatory background is broken down by the following topics: Water Quality; Regional Water Quality Management; Watershed Management; Wastewater Treatment; Drinking Water Standards; and local regulations.

3.5.1.1 Water Quality

The principal laws governing water quality in southern California are the federal Clean Water Act (CWA) and the corresponding California law, the Porter-Cologne Water Quality Act. The United States Environmental Protection Agency (U.S. EPA) is the federal agency responsible for water quality management and administration of the federal CWA. The U.S. EPA has delegated most of the administration of the CWA in California to the California State Water Resources Control Board (SWRCB). The SWRCB was established through the California Porter-Cologne Water Quality Act of 1969, and is the primary State agency responsible for water quality management issues in California. Much of the responsibility for implementation of the SWRCB's policies is delegated to the nine Regional Water Quality Control Boards (RWQCBs).

3.5.1.1.1 NPDES Permit Program

§402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to regulate discharges into "navigable waters" of the United States. The U.S. EPA authorized the SWRCB to issue NPDES permits in the State of California in 1974. The NPDES permit establishes discharge pollutant thresholds and operational conditions for industrial facilities and wastewater treatment plants. For point source discharges (e.g., wastewater treatment facilities), the RWQCBs prepare specific effluent limitations for constituents of concern such as toxic substances, total suspended solids (TSS), bio-chemical oxygen demand (BOD), and organic compounds. The limitations are based on the Basin Plan objectives and are tailored to the specific receiving waters, allowing some discharges, for instance deep water outfalls in the Pacific Ocean, more flexibility with certain constituents due to the ability of the receiving waters to accommodate the effluent without significant impact.

Non-point source NPDES permits are also required for municipalities and unincorporated communities of populations greater than 100,000 to control urban stormwater runoff. These municipal permits include Storm Water Management Plans (SWMPs). A key part of the SWMP is the development of Best Management Practices (BMPs) to reduce pollutant loads. Certain businesses and projects within the jurisdictions of these municipalities are required to prepare Storm Water Pollution Prevention Plans (SWPPPs) which establish the appropriate BMPs to gain coverage under the municipal permit. On October 29, 1999, the U.S. EPA finalized the Storm Water Phase II rule which requires smaller urban communities with a population less than 100,000 to acquire individual storm water discharge permits. The Phase II rule also requires construction activities on one to five acres to be permitted for storm water discharges. Individual storm water NPDES permits are required for specific industrial activities and for construction sites greater than five acres. Statewide general storm water NPDES permits have been developed to expedite discharge applications. They include the statewide industrial permit and the statewide construction permit. A prospective applicant may apply for coverage under one of these permits and receive Waste Discharge Requirements (WDRs) from the appropriate RWQCB. WDRs establish the permit conditions for individual dischargers. The Stormwater Phase II Rule automatically designates, as small construction activity under the NPDES stormwater permitting program, all operators of construction site activities that result in a land disturbance of equal to or greater than one and less than five acres. Site activities that disturb less than one acre are also regulated as small construction activity if they are part of a larger common plan of development or sale with a planned disturbance of equal to or greater than one acre and less than five acres, or if they are designated by the NPDES permitting authority. The NPDES permitting authority or U.S. EPA Region may designate construction activities disturbing less than one acre based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to waters of the United States (U.S. EPA, ~~2000~~2005).

3.5.1.1.2 Municipal Stormwater and Urban Runoff Discharge Permits

The Municipal Stormwater Permitting Program regulates stormwater discharges from municipal separate storm sewer systems (MS4s). The RWQCB, with oversight by U.S. EPA, administers the MS4 permitting program in the Los Angeles area. The MS4 permits require the municipal discharger (typically, a city or county) to develop and implement a SWMP with the goal of reducing the discharge of pollutants to the maximum extent practicable. The SWMP program specifies what BMPs will be applied to address certain program areas such as public education and outreach, illicit discharge detection and elimination, construction and port-construction, and good housekeeping for municipal operations. MS4 permits also generally include a monitoring program.

3.5.1.1.3 CWA Section 303 – Total Maximum Daily Loads

The CWA §303(d) requires the SWRCB to prepare a list of impaired water bodies in the State and determine total maximum daily loads (TMDLs) for pollutants or other stressors impacting water quality of these impaired water bodies. A TMDL is a quantitative assessment of water quality conditions, contributing sources, and the load reductions or control actions needed to restore and protect bodies of water in order to meet their beneficial uses. All sources of the pollutants that caused each body of water to be included on the list, including point sources and non-point sources, must be identified. The California §303 (d) list was completed in March 1999. On July 25, 2003, U.S. EPA gave final approval to California's 2002 revision of §303 (d) List of Water Quality Limited Segments. A priority schedule has been developed to determine TMDLs for impaired waterways. TMDL projects are in various stages throughout the district for most of the identified impaired water bodies. The RWQCBs will be responsible for ensuring that total discharges do not exceed TMDLs for individual water bodies as well as for entire watersheds.

3.5.1.1.4 State Water Quality Certification Program

The RWQCBs also coordinate the State Water Quality Certification program, or §401 of the CWA. Under §401, states have the authority to review any federal permit or license that will result in a discharge or disruption to wetlands and other waters under state jurisdiction to ensure that the actions will be consistent with the state's water quality requirements. This program is most often associated with §404 of the CWA which obligates the U.S. Army Corps of Engineers to issue permits for the movement of dredge and fill material into and from "waters of the United States".

3.5.1.2 Regional Water Quality Management

Water quality of regional surface water and groundwater resources is affected by point source and non-point source discharges occurring throughout individual watersheds. Regulated point sources, such as wastewater treatment effluent discharges, usually involve a single discharge into receiving waters. Non-point sources involve diffuse and non-specific runoff that enters receiving waters through storm drains or from unimproved natural landscaping. Common non-point sources include urban runoff, agriculture runoff, resource extraction (on-going and historical), and natural drainage. Within the regional Basin Plans, the RWQCBs establish water quality objectives for surface water and groundwater resources and designate beneficial uses for each identified water body.

The Basin Plan (Water Quality Control Plan: Los Regional Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties) (LARWQCB, 1994) is designed to preserve and enhance water quality and to protect beneficial uses of regional waters. The Basin Plan designates beneficial uses of surface water and ground water, such as contact recreation or municipal drinking water supply. The Basin Plan also establishes water quality objectives, which are defined as "the allowable limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance in a specific area." The Basin Plan specifies objectives for specific constituents, including bioaccumulation, chemical constituents, dissolved oxygen, oil and grease, pesticides, pH polychlorinated biphenyls, suspended solids, toxicity, and turbidity.

California Water Code, Division 7, Chapter 5.6 established a comprehensive program within the SWRCB to protect the existing and future beneficial uses of California's enclosed bays and estuaries. The Bay Protection and Toxic Cleanup Plan (BPTCP) has provided a new focus on the SWRCB and the RWQCBs' efforts to control pollution of the State's bays and estuaries by establishing a program to identify toxic hot spots and plans for their cleanup. In June 1999, the SWRCB published a list of known toxic hot spots in estuaries, bays, and coastal waters.

Other statewide programs run by the SWRCB to monitor water quality include the California State Mussel Watch Program and the Toxic Substances Monitoring Program. The Department of Fish and Game collects water and sediment samples for the SWRCB for both of these programs and provides extensive statewide water quality data reports annually. In addition, the RWQCBs conduct water sampling for Water Quality Assessments required by the CWA and for specific priority areas under restoration programs such as the Santa Monica Bay Restoration Program.

3.5.1.3 Watershed Management

In February 1998, the Clean Water Action Plan (CWAP) was established to require states and tribes, with assistance from federal agencies and input from stakeholders and private citizens, to convene and work collaboratively to develop Unified Watershed Assessments (UWA). The CWAP designated watersheds to one of the following categories:

Category I: Watersheds that are candidates for increased restoration because of poor water quality or the poor status of natural resources.

Category II: Watersheds that have good water quality but can still improve.

Category III: Watersheds with sensitive areas on federal, state, or tribal lands that need protection.

Category IV: Watersheds for which there is insufficient information to categorize them.

Targeted watersheds and watershed priorities and activities were identified for each of California's nine RWQCBs. Examples of targeted watersheds include the Santa Monica Bay Restoration Commission and the Malibu Creek Watershed Non-Point Source Pilot Project.

3.5.1.4 Wastewater Treatment

The federal government enacted the CWA to regulate point source water pollutants, particularly municipal sewage and industrial discharges, to waters of the United States through the NPDES permitting program. In addition to establishing a framework for regulating water quality, the CWA authorized a multibillion dollar Clean Water Grant Program, which together with the California Clean Water Bond funding, assisted communities in constructing municipal wastewater treatment facilities. These financing measures made higher levels of wastewater treatment possible for both large and small communities throughout California, significantly improving the quality of receiving waters statewide. Wastewater treatment and water pollution control laws in California are codified in the CWC and CCR, Titles 22 and 23. In addition to federal and state restrictions on wastewater discharges, most incorporated cities in California have adopted local ordinances for wastewater treatment facilities. Local ordinances generally require treatment system designs to be reviewed and approved by the local agency prior to construction. Larger urban areas with elaborate infrastructure in place would generally prefer new developments to hook into the existing system rather than construct new wastewater treatment facilities. Other communities promote individual septic systems to avoid construction of potentially growth accommodating treatment facilities. The RWQCBs generally delegate management responsibilities of septic systems to local jurisdictions. Regulation of wastewater treatment includes the disposal and reuse of biosolids.

3.5.1.5 Drinking Water Standards

The federal Safe Drinking Water Act, enacted in 1974 and implemented by the U.S. EPA, imposes water quality and infrastructure standards for potable water delivery systems nationwide. The primary standards are health-based thresholds established for numerous toxic substances. Secondary standards are recommended thresholds for taste and mineral content. The California Safe Drinking Water Act enacted in 1976 is codified in Title 22 of the CCR. Potable water supply is managed through the following agencies and water districts: the State Department of Water Resources (DWR), the State Department of Health Services (DHS), the SWRCB, the U.S. EPA, and the U.S. Bureau of Reclamation. Water right applications are processed through the SWRCB for properties claiming riparian rights. The DWR manages the State Water Project (SWP) and compiles planning information on water supply and water demand within the state. Primary drinking water standards are promulgated in the CWA §304 and these standards require states to ensure that potable water retailed to the public meets these standards. Standards for a total of 88 individual constituents, referred to as Maximum Contaminant Levels (MCLs) have been established under the Safe Drinking Water Act as amended in 1986 and 1996. The U.S. EPA may add additional constituents in the future. The MCL is the concentration that is not anticipated to produce adverse health effects after a lifetime of exposure. State primary and secondary drinking water standards are codified in CCR Title 22 §§64431-64501. Secondary drinking water standards incorporate non-health risk factors including taste, odor, and appearance. The 1991 Water Recycling Act established water recycling as a priority in California. The Water Recycling Act encourages municipal wastewater treatment districts to implement recycling programs to reduce local water demands. The DHS enforces drinking water standards in California.

3.5.1.6 Local Regulations

In addition to federal and state regulations, cities, counties and water districts may also provide regulatory advisement regarding water resources. Many jurisdictions incorporate policies related to water resources in their municipal codes, development standards, storm water pollution prevention requirements, and other regulations.

3.5.2 Hydrology

3.5.2.1 Water Sources

The DWR divided California into ten hydrologic regions corresponding to the state's major water drainage basins. The hydrologic regions define a river basin drainage area and are used as planning boundaries, which allows consistent tracking of water runoff, and the accounting of surface water and groundwater supplies (DWR, ~~2010~~2011).

The Basin lies within the South Coast Hydrologic Region. The South Coast Hydrologic Region is California's most urbanized and populous region. More than half of the state's population resides in the region (about 19.6 million people or about 54 percent of the state's population), which covers 11,000 square miles or seven percent of the state's total land. The South Coast Hydrologic Region extends from the Pacific Ocean east to the Transverse and

Peninsular Ranges, and from the Ventura-Santa Barbara County line south to the international border with Mexico and includes all of Orange County and portions of Ventura, Los Angeles, San Bernardino, Riverside, and San Diego counties (DWR, 2010).

Topographically, most of the South Coast Hydrologic Region is composed of several large, undulating coastal and interior plains. Several prominent mountain ranges comprise its northern and eastern boundaries and include the San Gabriel and San Bernardino mountains. Most of the region's rivers drain into the Pacific Ocean, and many terminate in lagoons or wetland areas that serve as important coastal habitat. Many river segments on the coastal plain, however, have been concrete-lined and in other ways modified for flood control operations (DWR, ~~2010~~2011).

There are 19 major rivers and watersheds in the South Coast Hydrologic Region. Many of these watersheds have densely urbanized lowlands with concrete-lined channels and dams controlling floodflows. The headwaters for many rivers, however, are within coastal mountain ranges and have remained largely undeveloped (DWR, ~~2010~~2011).

The cities of Ventura, Los Angeles, Long Beach, Santa Ana, San Bernardino, and Big Bear Lake are among the many urban areas in this section of the state, which contain moderate-sized mountains, inland valleys, and coastal plains. The Santa Clara, Los Angeles, San Gabriel, and Santa Ana rivers are among the area's hydrologic features. In addition to water sources within the South Coast Hydrologic Region, imported water makes up a major portion of the water used in the Basin. Water is brought into the South Coast Hydrologic Region from three major sources: the Sacramento-San Joaquin Delta (Delta), Colorado River, and Owens Valley/Mono Basin. Most lakes in this area are actually reservoirs, made to hold water coming from the SWP, the Los Angeles Aqueduct (LAA), and the Colorado River Aqueduct (CRA) including Castaic Lake, Lake Mathews, Lake Perris, Silverwood Lake, and Diamond Valley Lake. In addition to holding water, Lake Casitas, Big Bear Lake, and Morena Lake regulate local runoff.

3.5.2.2 Surface Water Hydrology

Surface water hydrology refers to surface water systems, including watersheds, floodplains, rivers, streams, lakes and reservoirs, and the inland Salton Sea.

3.5.2.2.1 Watersheds

Watersheds refer to areas of land, or basin, in which all waterways drain to one specific outlet, or body of water, such as a river, lake, ocean, or wetland. Watersheds have topographical divisions such as ridges, hills or mountains. All precipitation that falls within a given watershed, or basin, eventually drains into the same body of water (SCAG, 2012).

There are 20 major watersheds within southern California region, all of which are outlined and shaped by the various topographic features of the region. Given the physiographic characteristics of the region, most of the watersheds are located along the Transverse and Peninsular Ranges, and only a small number are in the desert areas (Mojave and Colorado Desert) (SCAG, 2012). Figure 3.5-1 presents a map of the watersheds within the district.

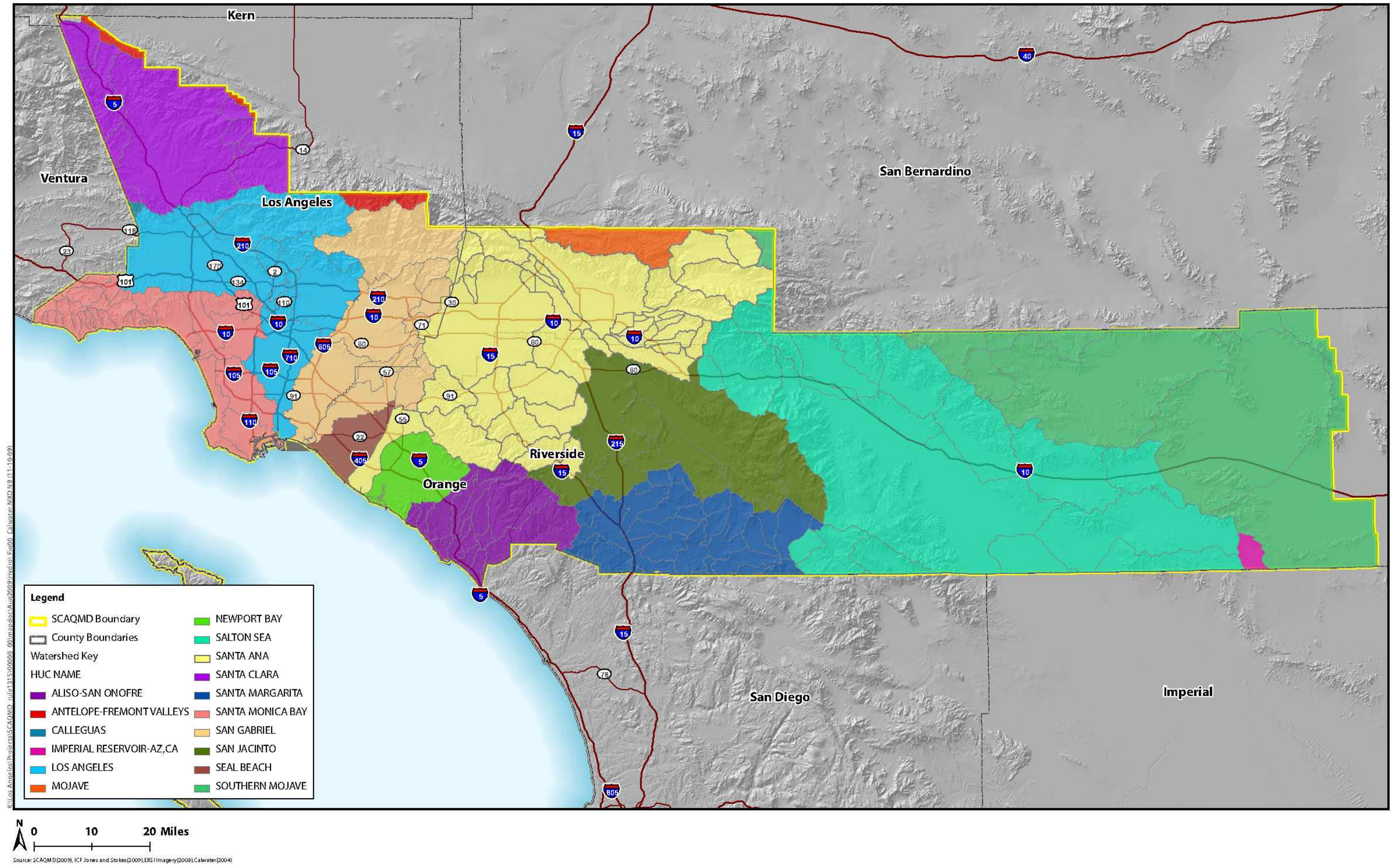


FIGURE 3.5-1

USGS Watersheds within the South Coast Air Quality Management District

3.5.2.2.2 Rivers

Because the climate of Southern California is predominantly arid, many of the natural rivers and creeks are intermittent or ephemeral, drying up in the summer or flowing only after periods of precipitation. For example, annual rainfall amounts vary depending on elevation and proximity to the coast. Some waterways such as Ballona Creek and the Los Angeles River maintain a perennial flow due to agricultural irrigation and urban landscape watering (SCAG, 2012). Figure 3.5-2 presents a map of the major rivers within the district.

Major natural streams and rivers in the South Coast Hydrologic Region include the Ventura River, Santa Clara River, Los Angeles River, San Gabriel River, Santa Ana River, San Jacinto River, and upstream portions of the Santa Margarita River.

The Ventura River, located outside of the district, is fed by Lake Casitas on the western border of Ventura County and empties out into the ocean. It is the northern-most river system in Southern California, supporting a large number of sensitive aquatic species. Water quality decreases in the lower reaches due to urban and industrial impacts.

The Santa Clara River starts in Los Angeles County, flows through the center of Ventura County, and remains in a relatively natural state. Threats to water quality include increasing development in floodplain areas, flood control measures such as channeling, erosion, and loss of habitat.

The Los Angeles River is a highly disturbed system due to the flood control features along much of its length. Due to the high urbanization in the area around the Los Angeles River, runoff from industrial and commercial sources as well as illegal dumping contribute to reduce the channel's water quality.

The San Gabriel River is similarly altered with concrete flood control embankments and impacted by urban runoff.

The Santa Ana River drains the San Bernardino Mountains, cuts through the Santa Ana Mountains, and flows onto the Orange County coastal plain. Recent flood control projects along the river have established reinforced embankments for much of the river's path through urbanized Orange County.

The Santa Margarita River begins in Riverside County, draining portions of the San Jacinto Mountains and flowing to the ocean through northern San Diego County.

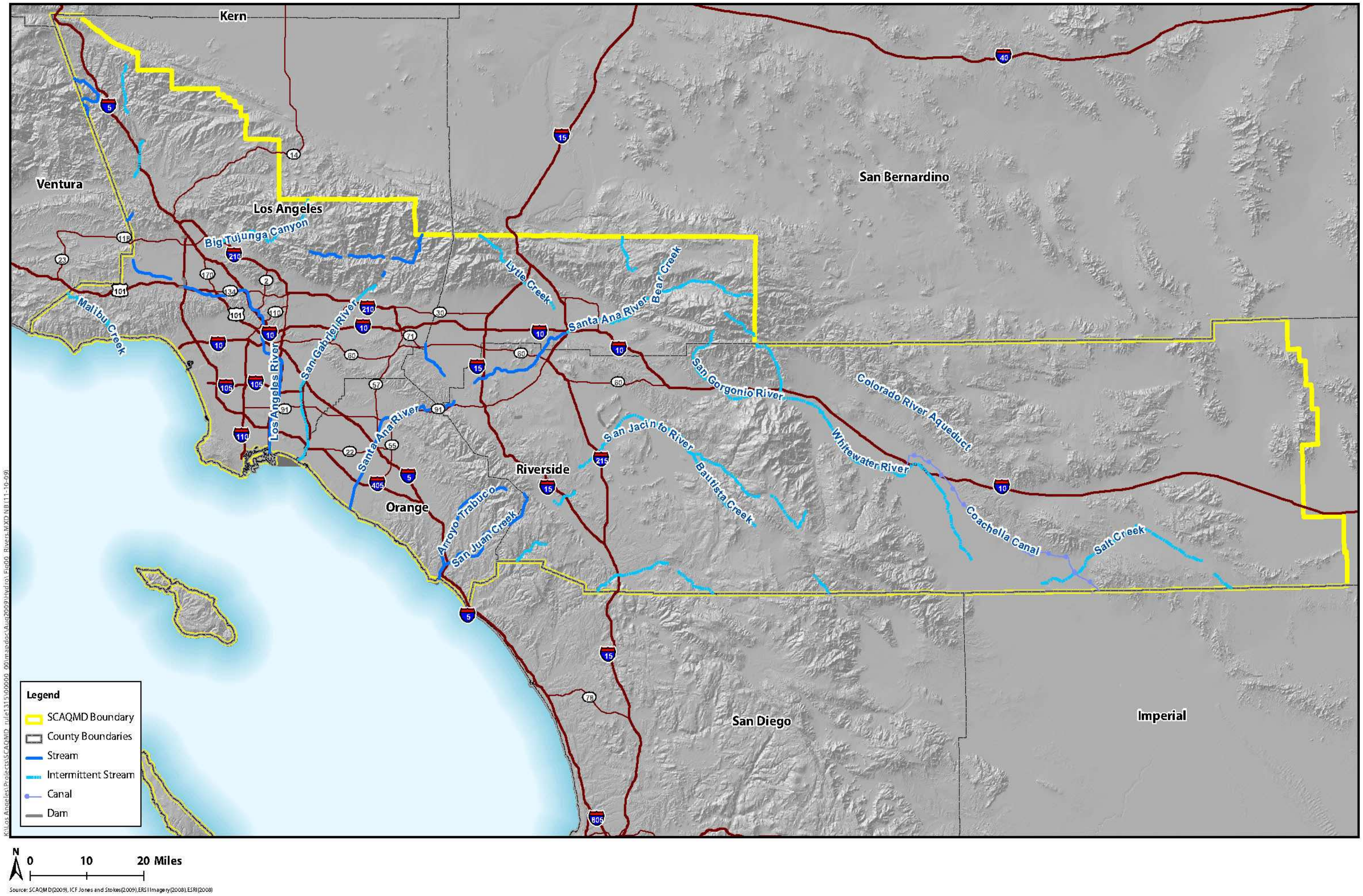


FIGURE 3.5-2

Rivers within South Coast Air Quality Management District

3.5.2.2.3 Lakes and Reservoirs

Since southern California is a semi-arid region, many of its lakes are drinking water reservoirs, created either through damming of rivers, or manually dug and constructed. Reservoirs also serve as flood control for downstream communities. Some of the most significant lakes, including reservoirs, in the Basin are Big Bear Lake, Lake Arrowhead, Lake Casitas, Castaic Lake, Pyramid Lake, Lake Elsinore, Diamond Valley Lake, and the Salton Sea (SCAG, 2012).

Big Bear Lake is a reservoir in San Bernardino County, in the San Bernardino Mountains. It was created by a granite dam in 1884, which was expanded in 1912, and holds back approximately 73,000 acre-feet[1] of water. The lake has no tributary inflow, and is replenished entirely by snowmelt. It provides water for the community of Big Bear, as well as nearby communities (SCAG, 2012).

Lake Arrowhead is also in San Bernardino County, at the center of an unincorporated community also called Lake Arrowhead. The lake is a man-made reservoir, with a capacity of approximately 48,000 acre-feet of water. In 1922, the dam at Lake Arrowhead was completed, with the intention of turning the area into a resort. It is now used for recreation and as a potable water source for the surrounding community (SCAG, 2012).

Lake Casitas is in Ventura County, and was formed by the Casitas Dam on the Coyote Creek just before it joins the Ventura River. The dam, completed in 1959, holds back nearly 255,000 acre-feet of water. The water is used for recreation, as well as drinking water and irrigation (SCAG, 2012).

Castaic Lake is on the Castaic Creek, and was formed by the completion of the Castaic Dam. The lake is in northwestern Los Angeles County. It is the terminus of the West Branch of the California Aqueduct, and holds over 323,000 acre-feet of water. Much of the water is distributed throughout northern Los Angeles County, though some is released into Castaic Lagoon, which feeds Castaic Creek. The creek is a tributary of the Santa Clara River (SCAG, 2012).

Pyramid Lake is just above Castaic Lake, and water flows from Pyramid into Castaic through a pipeline, generating electricity during the day. At night, when electricity demand and prices are low, water is pumped back up into Pyramid Lake. Pyramid Lake is on Piru Creek, and holds 180,000 acre-feet of water (SCAG, 2012).

Lake Elsinore is in the City of Lake Elsinore, in Riverside County. While the lake has been dried up and subsequently replenished throughout the last century, it now manages to maintain a consistent water level with outflow piped into the Temescal Canyon Wash (SCAG, 2012).

Diamond Valley Lake is Southern California's newest and largest reservoir. Located in Riverside County, it was a project of Metropolitan Water District (MWD) to expand surface

[1] One acre-foot is one acre of surface area of water to a depth of one foot and is equivalent to 360,000 gallons or 43,560 cubic feet of water.

storage capacity in the region. A total of three dams were required to create the lake. Completed in 1999, it was full by 2002, holding 800,000 acre-feet of water, effectively doubling MWD's surface water storage in the region. The lake is connected to the existing water infrastructure of the SWP. The lake is situated at approximately 1,500 feet above sea level, well above most of the users of the lake's water which enables the lake to also provide hydroelectric power, as water flows through the lowest dam (SCAG, 2012).

The Salton Sea is California's largest lake, nearly 400 square miles in size. The lake is over 200 feet below sea level, and has flooded and evaporated many times over, when the Colorado overtops its banks during extreme flood years. This cycle of flooding and evaporation has re-created the Salton Sea several times during the last thousand years and has resulted in high levels of salinity. The lake's most recent formation occurred in 1905 after an irrigation canal was breached and the Colorado River flowed into the basin for 18 months, creating the current lake (SCAG, 2012).

The principle inflow to the Salton Sea is from agricultural drainage, which is high in dissolved salts; approximately four million tons of dissolved salts flow into the Salton Sea every year. The evaporation of the Salton Sea's water, plus the addition of highly saline water from agriculture, has created one of the saltiest bodies of water in the world. The Sea has been a highly successful fishery and is a habitat and migratory stopping and breeding area for 380 different bird species; however, the high, and ever-increasing, salinity of the Sea has resulted in declining fish populations that inhabit it, resulting in declining local and migratory bird that rely on the fish as a food source (SCAG, 2012).

The major surface waters in this section are presented in Table 3.5-1.

TABLE 3.5-1

Major Surface Waters

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
	Los Angeles Basin	
Ventura River Estuary Santa Clara River Estuary McGrath Lake Ormond Beach Wetlands Mugu Lagoon Trancas Lagoon Topanga Lagoon Los Cerritos Wetlands Ballona Lagoon Los Angeles River Ballona Wetlands	Sespe Creek Piru Creek Ventura River Santa Clara River Los Angeles River Big Tujunga Canyon San Gabriel River Ballona Creek	Lake Casitas Lake Piru Pyramid Lake Castaic Lake Bouquet Reservoir Los Angeles Reservoir Chatsworth Reservoir Sepulveda Reservoir Hansen Reservoir San Gabriel Reservoir Morris Reservoir Whittier Narrows Reservoir Santa Fe Reservoir

TABLE 3.5-1 (Concluded)

Major Surface Waters

Wetlands	Rivers, Creeks, and Streams	Lakes and Reservoirs
Lahontan Basin		
	Mojave river Amargosa River	Silver Lake Silverwood Lake Mojave River Reservoir Lake Arrowhead Soda Lake
Colorado River Basin		
	Colorado River Whitewater River Alamo River New River	Lake Havasu Gene Wash Reservoir Copper Basin Reservoir Salton Sea Lake Cahuilla
Santa Ana Basin		
Hellman Ranch Wetlands Anaheim Bay Bolsa Chica Wetlands Huntington Wetlands Santa Ana River Laguna Lakes San Juan Creek Upper Newport Bay San Joaquin Marsh Prado Wetlands	Santa Ana River San Jacinto River	Prado Reservoir Big Bear Lake Lake Perris Lake Matthews Lake Elsinore Vail Lake Lake Skinner Lake Hemet Diamond Valley Lake

Source: Draft 2008 RTP Program EIR, January 2008 p. 3.15-14.

3.5.2.3 Groundwater Hydrology

Groundwater is the part of the hydrologic cycle representing underground water sources. Groundwater is present in many forms: in reservoirs, both natural and constructed; in underground streams; and, in the vast movement of water in and through sand, clay, and rock beneath the earth's surface. The place where groundwater comes closest to the surface is called the water table, which in some areas may be very deep, and in others may be right at the surface. Groundwater hydrology is, therefore, connected to surface water hydrology, and cannot be treated as a separate system. One example of how groundwater hydrology can directly impact surface water hydrology is when surface streams are partly filled by groundwater. When that groundwater is pumped out and removed from the system, the stream levels will fall, or even dry up entirely, even though no water was removed from the stream itself (SCAG, 2012).

Groundwater represents most of the Basin's fresh water supply, making up approximately 30 percent of total water use, depending on precipitation levels. Groundwater basins are replenished mainly through infiltration – precipitation soaking into the ground and making its way into the groundwater. Two threats to the function of this system are increases in impervious surface and overdraft (SCAG, 2012).

Impervious surface decreases the area available for groundwater recharge, as precipitation runoff flows off of streets, buildings, and parking lots directly into storm sewers, and straight into either river channels or into the ocean. This prevents the natural recharge of groundwater, effectively removing groundwater from the system without any pumping. Impervious surface also deteriorates the quality of the water, as it moves over streets and buildings, gathering pollutants and trash before entering streams, rivers, and the ocean (SCAG, 2012).

To prevent seawater intrusion in coastal basins in Orange County, recycled water is injected into the ground to form a mound of groundwater between the coast and the main groundwater basin. In Los Angeles County, imported and recycled water is injected to maintain a seawater intrusion barrier (SCAG, 2012).

VOCs and other non-organic contaminants such as perchlorates have created groundwater impairments in industrialized portions of the San Gabriel and San Fernando Valley groundwater basins, where some locations have been declared federal Superfund sites. Subsequently, perchlorate contamination was found in the San Gabriel Valley, and is being removed. The U.S. EPA continues to oversee installation of a groundwater cleanup system, components of which were installed beneath the cities of La Puente and Industry in 2006. Similar problems exist in the Bunker Hills sub-basin of the Upper Santa Ana Valley groundwater basin. Perchlorate contamination has also been found in wells in the cities of Rialto, Colton, and Fontana in San Bernardino County. The presence of contamination in the source water does not necessarily require the closure of a groundwater well. Water systems can implement water treatment accompanied by monthly monitoring for contaminants and/or may blend the problematic water with other “cleaner” water in order to reduce the concentration of the contaminants of concern in the water that is ultimately to be delivered to the end-users (SCAG, 2012).For these reasons, groundwater continues to be used as the predominant source of water supply in these areas (SCAG, 2012).

3.5.3 Water Demand and Forecasts

Estimating total water use in the district is difficult because the boundaries of supplemental water purveyors' service areas bear little relation to the boundaries of the district and there are dozens of individual water retailers within the district. Water demand in California can generally be divided between urban, agricultural, and environmental uses. In southern California, approximately 75 percent of potable water is provided from imported sources. Annual water demand fluctuates in relation to available supplies. During prolonged periods of drought, water demand can be reduced significantly through conservation measures, while in years of above average rainfall demand for imported water usually declines. In 2000, a ‘normal’ year in terms of annual precipitation, the demand for water in the State was between approximately 82 and 83 million acre-feet. Of this total, southern California accounted for approximately 9.8 million acre-feet (SCAG, 2012).

The increase in California’s water demand is due primarily to the increase in population. By employing a multiple future scenario analysis, the California Water Plan Update 2009 (DWR, 2010) provides a growth range for future annual water demand. According to the California Water Plan Update 2009, statewide future annual water demands range from an increase of fewer than 1.5 million acre-feet for the Slow and Strategic Growth scenario, to an increase of about 10 million acre-feet under the Expansive Growth scenario by year 2050. If southern California maintains its share of 12 percent of the state's water demand, the region could be expected to require an additional 500,000 acre-feet by 2030 (SCAG, 2012).

On June 4, 2008, Governor Arnold Schwarzenegger issued Executive Order S-06-08 and declared an official drought for California[2]. Further, California Water Code §71460 et seq. states that a water district may restrict the use of water during any emergency caused by drought, or other threatened or existing water shortage, and may prohibit the use of water during such periods for any purpose other than household uses or such other restricted uses as determined to be necessary. The water district may also prohibit the use of water during such periods for specific uses which it finds to be nonessential. On February 27, 2009, Governor Schwarzenegger proclaimed a state of emergency regarding the drought and the availability and future sustainability of California's water resources[3]. The proclamation directed all state government agencies to utilize their resources, implement a state emergency plan and provide assistance for people, communities and businesses impacted by the drought. The proclamation further requested that all urban water users immediately increase their water conservation activities in an effort to reduce their individual water use by 20 percent.

Water districts, in response to the drought, have also taken actions throughout the state such as: 1) asking for voluntary reductions; 2) imposing mandatory restrictions or declaring a local emergency; 3) imposing agricultural rationing; 4) imposing drought rates, surcharges and fines; 5) limiting new development and requiring water efficient landscaping; and, 6) implementing a conservation campaign. In addition, water shortages have prompted cities to begin infrastructure improvements to secure future water supplies.

Following substantial increases in statewide rainfall and mountain snowpack, on March 30, 2011, Governor Jerry Brown officially rescinded Executive Order S-06-08, issued on June 4, 2008 and ended the States of Emergency regarding the drought called on June 12, 2008, and on February 27, 2009. The fourth snow survey of the season was conducted by the DWR and found that water content in California's mountain snowpack was 165 percent of the April 1 full season average. At that time, a majority of the state's major reservoirs were also above normal storage levels. Based on this data, DWR estimated it will be able to deliver 70 percent of requested SWP water for 2011.

In 2012, a recent uptick in water use has occurred due to a dry winter and a below-normal snowpack. Statewide hydrologic conditions at the end of June 2012 showed 80 percent of average precipitation to date; runoff at 65 percent of average to date; and reservoir storage at 100 percent of average for the date. However, impacts of drought are typically felt first by those most reliant on annual rainfall such as small water systems lacking a reliable source, rural residents relying on wells in low-yield rock formations, or ranchers engaged in dryland grazing. As of mid-July 2012, 75-percent of California's pasture and range land is reported to be experiencing "poor" or "very poor" water conditions. So, some regions of California

[2] http://gov.ca.gov/press-release/9796
[3] http://gov.ca.gov/press-release/11556/

may be experiencing a national trend toward drought. Over half of the contiguous U.S. is experiencing drought conditions, the largest percentage of the nation experiencing drought conditions in the 12-year record of the U.S. Drought Monitor.

3.5.3.1 Water Suppliers

Southern California is served by many water suppliers, both retail and wholesale with MWD being the largest. Created by the California legislature in 1931, MWD serves the urbanized coastal plain from Ventura in the north to the Mexican border in the south to parts of the rapidly urbanizing counties of San Bernardino and Riverside in the east. MWD provides water to about 90 percent of the urban population of southern California. MWD is comprised of 26 member agencies, with 12 supplying wholesale water to retail agencies and other wholesalers. The remaining 14 agencies are individual cities which directly supply water to their residents. A list of the major water suppliers operating within the district is provided in Table 3.5-2.

MWD's largest water customers are the San Diego County Water Authority (28 percent of MWD's supplies based on 2005-2009 average), the LADWP (15 percent) and the Municipal Water District of Orange County (13 percent). The reliance on MWD's water supplies varies by agency. For example, in recent years, Upper San Gabriel received as little as five percent (in fiscal year 2008/09) of its total water supply from MWD, while Beverly Hills received over 93 percent. However, this relative share of local and imported supplies varies from year to year based on supply and demand conditions (MWD, 2010).

MWD monitors demographics in its service area since water demand is heavily influenced by population size, geographical distribution, variation in precipitation levels, and water conservation practices. In 1990, the population of MWD's service area was approximately 14.8 million people. By 2010, it had reached an estimated 19.1 million, representing about 50 percent of the state's population. Growth has generally been around 200,000 persons per year since 2002. The MWD service area is estimated to reach an estimated population of 21.3 million in 2025, and 22.5 million by 2035 (MWD, 2010). Average per capita water usage generally ranges from 170 to 285 gallons per day (SCAG, 2012).

Actual retail water demands within MWD's service area have increased from 3.1 million acre-feet in 1980 to a projected 4.0 million acre-feet in 2010. This represents an estimated annual increase of about 1.0 percent. A similar gradual increase in estimated total retail water demand is expected between 2010 and 2035 (see Table 3.5-2) (MWD, 2010).

Of the estimated 4.0 million acre-feet of total retail water use in 2010, 93 percent is due to municipal and industrial uses, with agriculture accounting for the other seven percent. The relative share of municipal and industrial water use has increased over time at the expense of agricultural use which has declined due to urbanization and market factors. By 2035, it is estimated that agriculture will account for only about four percent of total MWD retail demands. It is estimated that total municipal and industrial water use will grow from an annual average of 4.0 million acre-feet in 2010 to 4.7 million acre-feet in 2035. All water demand projections assume normal weather conditions. Future changes in estimated water demand assumes continued water savings due to conservation measures such as water savings resulting from plumbing codes, price effects, and the continuing implementation of utility-funded conservation Best Management Practices (BMPs) (MWD, 2010) (see Table 3.5-2).

TABLE 3.5-2

2015 – 2035 Projected Water Demand

Water District	2015 Demand (MAF)[a]	2020 Demand (MAF)	2025 Demand (MAF)	2030 Demand (MAF)	2035 Demand (MAF)
MWD [b]	5.45	5.63	5.77	5.93	6.07
LADWP [c]	0.615	0.652	0.676	0.701	0.711
Antelope Valley/East Kern Water Agency [d]	0.091	0.093	0.095	0.097	N/A [e]
Castaic Lake Water Agency [f]	0.080	0.088	0.097	0.105	0.114
Coachella Valley Water District [g]	0.596	0.624	0.661	0.671	0.689
Crestline-Lake Arrowhead Water Agency [h]	0.0015	0.0019	0.0021	0.0023	0.0024
Desert Water Agency [i]	0.055	0.059	0.065	0.069	0.073
Palmdale Water Agency [j]	0.035	0.040	0.045	0.055	0.060
San Bernardino Valley Municipal [k]	0.240	0.256	0.284	0.305	0.324
San Gorgonio Pass Water Agency [l]	0.039	0.048	0.060	0.072	0.078
Municipal Water District of Orange County [m]	0.526	0.543	0.558	0.564	0.568

(a) MAF = million acre-feet (b) LADWP, 2010 (c) MWD, 2010 (d) AVEKWA, 2010
(e) Not Available (f) CLWA, ~~2010~~2011 (g) ~~CVWM~~CVWD, ~~2010~~2011 (h) CLAWA, ~~2010~~2011
(i) DWA, ~~2010~~2011 (j) PWD, ~~2010~~2011 (k) SBVMWD, ~~2010~~2011 (l) SGPWA, 2010
(m) MWDOC, ~~2010~~2011

3.5.3.2 Water Uses

While most land use in the region is urban, other land uses include national forest and a small percentage of irrigated crop acreage (DWR, 1998). The South Coast Hydrologic Region is the most populous and urbanized region in California. In some portions of the region, water users consume more water than is locally available, which has resulted in an overdraft of groundwater resources and increasing dependence on imported water supplies. The distribution of water uses, however, varies dramatically across the South Coast's planning areas. As a result of recent droughts, South Coast water users have generally become more water efficient. Municipal water agencies are engaged in aggressive water conservation and efficiency programs to reduce per capita water demand. As a result of changes in plumbing codes, energy and water efficiency innovations in appliances, and trends toward more water efficient landscaping practices, urban water demand has become more efficient (DWR, 2010).

For the South Coast region, urban water uses are the largest component of the developed water supply, while agricultural water use is a smaller but significant portion of the total. Imported water supplies and groundwater are the major components of the water supply for this region, with minor supplies from local surface waters and recycled water (DWR, 2010).

Of the total water supply to the region, more than half is either used by native vegetation; evaporates to the atmosphere; provides some of the water for agricultural crops and managed wetlands (effective precipitation); or flows to the Pacific Ocean and salt sinks like saline groundwater aquifers. The remaining portion is distributed among urban and agricultural uses and for diversions to managed wetlands (DWR, 2010).

3.5.3.2.1 Residential Water Use

While single-family homes are estimated to account for about 61 percent of the total occupied housing stock in 2010, they are responsible for about 74 percent of total residential water demands. This is consistent with the fact that single-family households are known to use more water than multifamily households (e.g., those residing in duplexes, triplexes, apartment buildings and condo developments) on a per housing-unit basis. This is because single-family households tend to have more persons living in the household; they are likely to have more water-using appliances and fixtures; and they tend to have more landscaping (MWD, 2010).

3.5.3.2.2 Non-residential Water Use

Nonresidential water use represents an approximately 25 percent of the total municipal and industrial demands in MWD's service area. This includes water that is used by businesses, services, government, institutions (such as hospitals and schools), and industrial (or manufacturing) establishments. Within the commercial/institutional category, the top water users include schools, hospitals, hotels, amusement parks, colleges, laundries, and restaurants. In southern California, major industrial users include electronics, aircraft, petroleum refining, beverages, food processing, and other industries that use water as a major component of the manufacturing process (MWD, 2010).

3.5.3.2.3 Agricultural Water Use

Agricultural water use currently constitutes about seven percent of total regional water demand in MWD’s service area. Agricultural water use accounted for 19 percent of total regional water demand in 1970, 16 percent in 1980, 12 percent in 1990 and five percent in 2008. Part of the reduction seen in 2008 was a 30 percent mandatory reduction in MWD’s Interim Agricultural Water Program deliveries, which continued into 2009 and a 25 percent reduction in 2010 (MWD, 2010). Improved technology has allowed growers to more accurately distribute water to the individual trees. In addition, pressure compensating valves and emitters have enabled growers to irrigate on steep slopes with better precision. Maximizing agricultural irrigation systems lowers the growers’ irrigation demands (DWR, 2010).

3.5.4 Water Supply

To meet current and growing demands for water, the South Coast region is leveraging all available water resources: imported water, water transfers, conservation, captured surface water, groundwater, recycled water, and desalination. Given the level of uncertainty about water supply from the Delta and Colorado River, local agencies have emphasized diversification. Local water agencies now utilize a diverse mixture of local and imported sources and water management strategies to adequately meet urban and agricultural demands each year (DWR, 2010).

Water used in MWD's service area comes from both local and imported sources. Local sources include groundwater, surface water, and recycled water. Sources of imported water include the Colorado River, the SWP, and the Owens Valley/Mono Basin. Local sources meet about 45 percent of the water needs in MWD's service area, while imported sources supply the remaining 55 percent (MWD, 2010).

The City of Los Angeles imports water from the eastern Owens Valley/Mono Basin in the Sierra Nevada through the LAA. This water currently meets about seven percent of the region's water needs based on a five-year average from 2005-2009, but is dedicated for use by the city of Los Angeles. Contractually and for planning purposes, MWD treats the LAA as a local supply, although physically its water is imported from outside the region. Other supplies come from local sources, and MWD provides imported water supplies to meet the remaining 47 percent of the region's water needs based on the same five-year period. These imported supplies are received from MWD's CRA and the SWP's California Aqueduct (MWD, 2010).

3.5.4.1 Imported Water Supplies

Water is brought into the South Coast region from three major sources: the Delta, Colorado River, and Owens Valley/Mono Basin. All three are facing water supply cutbacks due to climate change and environmental issues. Although historically imported water served to help the South Coast region grow, it is today relied upon to sustain the existing population and economy. As such, parties in the South Coast region are working closely with other regions, the State, and federal agencies to address the challenges facing these imported supplies. Meanwhile, the South Coast region is working to develop new local supplies to meet the needs of future population and economic growth (DWR, 2010).

Most MWD member agencies and retail water suppliers depend on imported water for a portion of their water supply. For example, Los Angeles and San Diego (the largest and second largest cities in the state) have historically (1995-2004) obtained about 85 percent of their water from imported sources. These imported water requirements are similar to those of other metropolitan areas within the state, such as San Francisco and other cities around the San Francisco Bay (MWD, 2010). A list of major water suppliers operating within the district region is given in Table 3.5-3.

TABLE 3.5-3

Major Water Suppliers in the District Region

Water Agency	Land Area (square miles)	Sources of Water Supply
Antelope Valley and East Kern District	2,350	SWP, groundwater, reclaimed water
Bard Irrigation District (and Yuma Project Reservation Division)	23	Colorado River
Castaic Lake Water Agency	125	SWP
Coachella Valley Water District	974	SWP, Colorado River, and local
Crestline Lake Arrowhead	53	SWP
Desert Water Agency	324	SWP and groundwater
Imperial Irrigation District	1,658	Colorado River
Littlerock Creek Irrigation District	16	SWP, groundwater, and surface water
Metropolitan Water District of Southern California	5,200	SWP, Colorado River
Mojave Water Agency	4,900	SWP and groundwater
Palmdale Water Agency	187	SWP and groundwater
Palo Verde Irrigation District	188	Colorado River
San Bernardino Municipal Water	328	SWP and groundwater
San Gorgonio Pass Water Agency	214	Groundwater

Source: Draft 2008 RTP Program EIR, January 2008 p. 3.15-22.

3.5.4.1.1 State Water Project

The SWP is an important source of water for the South Coast region wholesale and retail suppliers. SWP contractors in the region take delivery of and convey the supplies to regional wholesalers and retailers. Contractors in the region are MWD, Castaic Lake Water Agency, San Bernardino Valley Municipal Water District (MWD), Ventura County Watershed Protection District (formerly Ventura County Flood Control District), San Gorgonio Pass Water Agency, and San Gabriel Valley Municipal Water District (DWR, 2010).

The SWP provides imported water to the MWD service area. Since 2002, SWP deliveries have accounted for as much as 70 percent of its water. In accordance with its contract with the DWR, MWD has a Table A allocation of about 1.91 million acre-feet per year under contract from the SWP. Actual deliveries have never reached this amount because they depend on the availability of supplies as determined by DWR. The availability of SWP supplies for delivery through the California Aqueduct over the next 18 years is estimated according to the historical record of hydrologic conditions, existing system capabilities as may be influenced by environmental permits, requests from state water contractors and SWP contract provisions for allocating Table A, Article 21 and other SWP deliveries. The estimates of SWP deliveries to MWD are based on DWR's most recent SWP reliability estimates contained in its SWP Delivery Reliability Report 200716 and the December 2009 draft of the biannual update (MWD, 2010). The amount of precipitation and runoff in the Sacramento and San Joaquin watersheds, system reservoir storage, regulatory requirements, and contractor demands for SWP supplies impact the quantity of water available to MWD (MWD, 2010).

MWD and 28 other public entities have contracts with the State of California for SWP water. These contracts require the state, through its DWR, to use reasonable efforts to develop and maintain the SWP supply. The state has constructed 28 dams and reservoirs, 26 pumping and generation plants, and about 660 miles of aqueducts. More than 25 million California residents benefit from water from the SWP. DWR estimates that with current facilities and regulatory requirements, the project will deliver approximately 2.3 million acre-feet under average hydrology considering impacts attributable to the combined Delta smelt and salmonid species biological opinions (MWD, 2010). Under the water supply contract, DWR is required to use reasonable efforts to maintain and increase the reliability of service to its users.

3.5.4.1.2 Colorado River System

Another key imported water supply source for the South Coast region is the Colorado River. California water agencies are entitled to 4.4 million acre-feet annually of Colorado River water. Of this amount, 3.85 million acre-feet are assigned in aggregate to agricultural users; 550,000 acre-feet is MWD's annual entitlement. Until a few years ago, MWD routinely had access to 1.2 million acre-feet annually because Arizona and Nevada had not been using their full entitlement and the Colorado River flow was often adequate enough to yield surplus water (DWR, 2010).

A number of water agencies within California have rights to divert water from the Colorado River. Through the Seven Party Agreement (1931), seven agencies recommended apportionments of California's share of Colorado River water within the state. Table 3.5-4 shows the historic apportionment of each agency, and the priority accorded that apportionment.

The water is delivered to MWD's service area by way of the CRA, which has a capacity of nearly 1,800 cubic feet per second or 1.3 million acre-feet per year. The CRA conveys water 242 miles from its Lake Havasu intake to its terminal reservoir, Lake Mathews, near the city of Riverside. Conveyance losses along the Colorado River Aqueduct of 10 thousand acre-feet per year reduce the amount of Colorado River water received in the coastal plain (MWD, 2010).

TABLE 3.5-4

Priorities of the Seven Party Agreement

Priority	Description	TAF[(a)] Annually
1	Palo Verde Irrigation District – gross area of 104,500 acres of land in the Palo Verde Valley	3,850
2	Yuma Project (Reservation Division) – not exceeding a gross area of 25,000 acres in California	
3(a)	Imperial Irrigation District and land in Imperial and Coachella Valleys[b] to be served by All American Canal	
3(b)	Palo Verde Irrigation District—16,000 acres of land on the Lower Palo Verde Mesa	
4	Metropolitan Water District of Southern California for use on the coastal plain of Southern California[c]	550
Subtotal		**4,400**
5(a)	Metropolitan Water District of Southern California for use on the coastal plain of Southern California	550
5(b)	Metropolitan Water District of Southern California for use on the coastal plain of Southern California[c]	112
6(a)	Imperial Irrigation District and land in Imperial and Coachella Valleys1 to be served by the All American Canal	300
6(b)	Palo Verde Irrigation District—16,000 acres of land on the Lower Palo Verde Mesa	
7	Agricultural Use in the Colorado River Basin in California	
	Total Prioritized Apportionment	**5,362**

Source: MWD, 2010

(a) TAF = thousand acre-feet.

(b) The Coachella Valley Water District now serves Coachella Valley

(c) In 1946, the City of San Diego, the San Diego County Water Authority, Metropolitan, and the Secretary of the Interior entered into a contract that merged and added the City of San Diego's rights to store and deliver Colorado River water to the rights of MWD. The conditions of that agreement have long since been satisfied.

Since the date of the original contract, several events have occurred that changed the dependable supply that MWD expects from the CRA. The most significant event was the 1964 U.S. Supreme Court decree in Arizona v. California that reduced MWD's dependable supply of Colorado River water to 550 thousand acre-feet per year. The reduction in dependable supply occurred with the commencement of Colorado River water deliveries to the Central Arizona Project (MWD, 2010). The court decision lead to a number of other contracts and agreements on how Colorado River water is divided among various users, the key ones of which are summarized below (MWD, 2010).

- In 1987, MWD entered into a contract with the United States Bureau of Reclamation (USBR) for an additional 180 thousand acre-feet per year of surplus water, and 85 thousand acre-feet per year through a conservation program with the Imperial Irrigation District.

- In 1979, the Present Perfected Rights of certain Indian reservations, cities, and individuals along the Colorado River were quantified.
- In 1999, California's Colorado River Water Use Plan (Plan) was developed to provide a framework for how California would make the transition from relying on surplus water supplies from the Colorado to living within its normal water supply apportionment. To implement these plans, the Quantification Settlement Agreement (QSA) and several other related agreements were executed. The QSA quantifies the use of water under the third priority of the Seven Party Agreement and allows for implementation of agricultural conservation, land management, and other programs identified in MWD's 1996 Integrated Water Resources Plan (IRP). The QSA has helped California reduce its reliance on Colorado River water above its normal apportionment.
- In October 2004, the Southern Nevada Water Authority and MWD entered into a storage and interstate release agreement. Under this program, Nevada can request that MWD to store unused Nevada apportionment in MWD's service area. The stored water provides flexibility to MWD for blending Colorado River water with SWP water and improves near-term water supply reliability.
- In December 2007, the Secretary of the Interior approved the adoption of specific interim guidelines for reductions in Colorado River water deliveries during declared shortages and coordinated operations of Lake Powell and Lake Mead.
- In May 2006, the MWD and the USBR executed an agreement for a demonstration program that allowed the MWD to leave conserved water in Lake Mead that MWD would otherwise have used in 2006 and 2007. As of January 1, 2010, MWD had nearly 80 thousand acre-feet of conservation water stored in Lake Mead (MWD, 2010).
- The December 2007 federal guidelines provided the Colorado River contractors with the ability to create system efficiency projects. By funding a portion of the reservoir projects at Imperial Dam, an additional 100 thousand acre-feet of water was allocated to MWD.

MWD is undertaking ongoing efforts to maintain and improve the flexibility and quality of its water supply from the Colorado River. MWD recognizes that in the short-term, programs are not yet in place to provide the full targeted amount, even with the programs adopted under the QSA and the opportunities to store conserved water in Lake Mead. The December 2007 federal guidelines concerning the operation of the Colorado River system reservoirs provide more certainty to MWD with respect to the determination of a shortage, normal, or surplus condition for the operation of Lake Mead (MWD, 2010).

3.5.4.1.3 Owens Valley Mono Basin (Los Angeles Aqueduct)

High-quality water from the Mono Basin and Owens Valley is delivered through the LAA to the City of Los Angeles. Construction of the original 233-mile aqueduct from the Owens Valley was completed in 1913, with a second aqueduct completed in 1970 to increase capacity. Approximately 480,000 acre-feet per year of water can be delivered to the City of

Los Angeles each year; however the amount of water the aqueducts deliver varies from year to year due to fluctuating precipitation in the Sierra Nevada Mountains and mandatory instream flow requirements (DWR, 2010).

Diversion of water from Mono Lake has been reduced following State Water Board Decision 1631. Exportation of water from the Owens Valley is limited by the Inyo-Los Angeles Long Term Water Agreement (and related Memorandum of Understanding) and the Great Basin Air Pollution Control District/City of Los Angeles Memorandum of Understanding (to reduce particulate matter air pollution from the Owens Lake bed) (DWR, 2010).

Over time, environmental considerations have required that the City reallocate approximately one-half of the LAA water supply to environmental mitigation and enhancement projects. As a result, the City of Los Angeles has used approximately 205,800 acre-feet of water supplies for environmental mitigation and enhancement in the Owens Valley and Mono Basin regions in 2010, which is in addition to the almost 107,300 acre-feet per year supplied for agricultural, stockwater, and Native American Reservations. Limiting water deliveries to the City of Los Angeles from the LAA has directly led to increased dependence on imported water supply from MWD. LADWP's purchases of supplemental water from MWD in FY 2008/09 reached an all-time high (LADWP, 2010).

LAA deliveries comprise 39 percent of the total runoff in the eastern Sierra Nevada in an average year. The vast majority of water collected in the eastern Sierra Nevada stays in the Mono Basin, Owens River, and Owens Valley for ecosystem and other uses (LADWP, 2010).

Annual LAA deliveries are dependent on snowfall in the eastern Sierra Nevada. Years with abundant snowpack result in larger quantities of water deliveries from the LAA, and typically lower supplemental water purchases from MWD. Unfortunately, a given year's snowpack cannot be predicted with certainty, and thus, deliveries from the LAA system are subject to significant hydrologic variability (LADWP, 2010).

The impact to LAA water supplies due to varying hydrology in the Mono Basin and Owens Valley is amplified by the requirements to release water for environmental restoration efforts in the eastern Sierra Nevada. Since 1989, when City water exports were significantly reduced to restore the Mono Basin's ecosystem, LAA deliveries from the Mono Basin and Owens Valley have ranged from 108,503 acre-feet in 2008/09 to 466,584 acre-feet in 1995/96. Average LAA deliveries since 1989/90 have been approximately 264,799 acre-feet, about 42 percent of the City of Los Angeles' total water needs (LADWP, 2010).

3.5.4.2 Local Water Supplies

Approximately 50 percent of the region's water supplies come from resources controlled or operated by local water agencies. These resources include water extracted from local groundwater basins, catchment of local surface water, non-MWD imported water supplied through the Los Angeles Aqueduct, and Colorado River water exchanged for MWD supplies (MWD, 2010).

Local sources of water available to the region include surface water, groundwater, and recycled water. Some of the major river systems in southern California have been developed into systems of dams, flood control channels, and percolation ponds for supplying local water and recharging groundwater basins. For example, the San Gabriel and Santa Ana rivers capture over 80 percent of the runoff in their watersheds. The Los Angeles River system, however, is not as efficient in capturing runoff. In its upper reaches, which make up 25 percent of the watershed, most runoff is captured with recharge facilities. In its lower reaches, which comprise the remaining 75 percent of the watershed, the river and its tributaries are lined with concrete, so there are no recharge facilities. The Santa Clara River in Ventura County is outside of MWD's service area, but it replenishes groundwater basins used by water agencies within MWD's service area. Other rivers in MWD's service area, such as the Santa Margarita and San Luis Rey, are essentially natural replenishment systems (MWD, 2010).

3.5.4.3 Surface Water

Local surface capture plays an important water resource role in the South Coast region. More than 75 impound structures are used to capture local runoff for direct use or groundwater recharge, operational or emergency storage for imported supplies, or flood protection. While precipitation contributes most of the annual volume of streamflow to the region's waterways, urban runoff, wastewater discharges, agricultural tailwater, and surfacing groundwater are the prime sources of surface flow during non-storm periods. The South Coast has experienced a trend of increasing dry weather flows during the past 30 years as the region has developed, due to increased imported water use and associated urban runoff (DWR, 2101).

Surface water runoff augments groundwater and surface water supplies. However, the regional demand far surpasses the potential natural recharge capacity. The arid climate, summer drought, and increased urbanization contribute to the inadequate natural recharge. Urban and agricultural runoff can contain pollutants, which decrease the quality of local water supplies. Local agencies maintain surface reservoir capacity to capture local runoff. The average yield captured from local watersheds is estimated at approximately 90 thousand acre-feet per year. The majority of this supply comes from reservoirs within the service area of the San Diego County Water Authority (MWD, 2010).

3.5.4.4 Groundwater

During the first half of the 20th century, groundwater was an important factor in the expansion of the urban and agricultural sectors in the South Coast region. Today, it remains important for the Santa Clara, MWD Los Angeles and Santa Ana planning areas, but only a small source for San Diego. Court adjudications recharge operations, and other management programs are helping to maintain the supplies available from many of the region's groundwater basins. Since the 1950s, conjunctive management and groundwater storage has been utilized to increase the reliability of supplies, particularly during droughts. Using the region's other water resources, groundwater basins are being recharged through spreading basins and injection wells. During water shortages of the imported supplies, more groundwater would be extracted to make up the difference. Water quality issues have impacted the reliability of supplies from some basins. However, major efforts are underway to address the problems and increase supplies for these basins (DWR, 2010).

The groundwater basins that underlie the region provide approximately 86 percent of the local water supply in southern California. The major groundwater basins in the region provide an annual average supply of approximately 1.35 million acre-feet. Most of this water recharges naturally, but approximately 200 thousand acre-feet has historically been replenished each year through MWD imported supplies. By 2025, estimates show that groundwater production will increase to 1.65 million acre-feet (MWD, 2010).

Because the groundwater basins contain a large volume of stored water, it is possible to produce more than the natural recharge of 1.16 million acre-feet and the imported replenishment amount for short periods of time. During a dry year, imported replenishment deliveries can be postponed, but doing so requires that the shortfall be restored in wet years. Similarly, in dry years the level of the groundwater basins can be drawn down, as long as the balance is restored to the natural recharge level by increasing replenishment in wet years. Thus, the groundwater basins can act as a water bank, allowing deposits in wet years and withdrawals in dry years (MWD, 2010).

3.5.4.5 Recycled Water

Local water recycling projects involve further treatment of secondary treated wastewater that would be discharged to the ocean or streams and use it for direct non-potable uses such as landscape and agricultural irrigation, commercial and industrial purpose and for indirect potable uses such as groundwater recharge, seawater intrusion barriers, and surface water augmentation (MWD, 2010).

Within MWD's service area, there are approximately 355,000 acre-feet of planned and permitted uses of recycled water supplies. Actual use is approximately 209,000 acre-feet, which includes golf course, landscape, and cropland irrigation; industrial uses; construction applications; and groundwater recharge, including maintenance of seawater barriers in coastal aquifers. MWD projects the development of 500,000 acre-feet of recycled water supplies (including groundwater recovery) by 2025 (DWR, 2010).

Current average annual recycled water production in the MWD Los Angeles Planning Area is approximately 225 million gallons per day (mgd), which represents approximately 25 percent of the current average annual effluent flows. The Water Replenishment District (WRD) is permitted to recharge up to 50,000 acre-feet per year (45 mgd) of Title 22 recycled water for ground water replenishment of the Montebello Forebay. West Basin Municipal Water Districts's (WBMWD) Edward Little Water Recycling Facility in El Segundo, which produced approximately 24,500 acre-feet in 2004-2005, recently completed its Phase IV Expansion Project. Approximately 12,500 acre-feet per year of the water produced at this facility is purchased by WRD and injected into the West Coast Barrier. The use of recycled water by LADWP is projected to be approximately 50,000 acre-feet per year by 2019 (DWR, 2010).

Recycled water currently represents approximately four percent of the total water demands in the Santa Ana Planning Area. Eastern Municipal Water District (EMWD) recycles effluent from four wastewater treatment plants. EMWD is also investigating the feasibility of indirect potable reuse through groundwater recharge. The Irvine Ranch Water District (IRWD) has developed an extensive recycled water treatment and delivery system and will expand capacity through 2013 to meet expected recycled water demand. The Inland Empire Utilities Agency is expanding its water recycling with a goal of meeting 20 percent of their demand or 50,000 acre-feet with recycled water. The Western Water Recycling Facility, owned and operated by Western Municipal Water District, is currently being upgraded and expanded. As infrastructure is further developed, recycled water is projected to surpass surface water as a water supply source for the planning area. The Orange County Water District (OCWD) and Orange County Sanitation District's Groundwater Replenishment System provides 72,000 acre-feet per year of recycled water for groundwater recharge and injection along the seawater barrier (DWR, 2010).

The San Diego Planning Area contains a number of recycled water facilities. In Riverside County, water reclamation facilities include Santa Rosa and Temecula Valley which provide non-potable supplies for local use. Seventeen recycled water tertiary treatment facilities are located within San Diego County. The use of tertiary treated recycled water within the San Diego area is projected to increase from 11,500 acre-feet per year in 2005 to 47,600 acre-feet per year in 2030. In September 2008, the City of San Diego approved funding for a demonstration project that releases advanced treated wastewater to San Vicente Reservoir for blending and subsequent additional treatment prior to redistribution (DWR, 2010).

3.5.4.6 Desalination Plants

In the MWD Los Angeles Planning Area, the Robert W. Goldsworthy Desalter, owned and operated by the WRD, processes approximately 2.75 mgd of brackish groundwater desalination for the purpose of remediating a saline plume located within the West Coast sub-basin and providing a reliable local water source to Torrance (DWR, 2010).

The potential for groundwater banking in the Santa Ana Planning Area is substantial, but the volume of clean water that can be stored may be hindered by high salt concentrations in the existing groundwater. In the Santa Ana watershed, three groundwater desalination plants have been constructed and are producing a total of 24 mgd. The Temescal plant, constructed and operated by the City of Corona, has a capacity of 15 mgd. The Menifee and Perris Desalters, owned and operated by EMWD, are producing seven MGD. The Chino Basin Desalter Authority operates Chino I and Chino II Desalters, which are producing 24 mgd (26,000 acre-feet per year) (DWR, 2010).

The Irvine Desalter Project, a joint groundwater quality restoration project by Irvine Ranch Water District and Orange County Water District, yields 7,700 acre-feet per year of potable drinking water and 3,900 acre-feet per year of non-potable water. The Tustin Seventeenth Street Desalter, owned and operated by the City of Tustin yields approximately 2,100 acre-feet per year. The Arlington Desalter, managed by Western MWD, delivers approximately 6,400 acre-feet of treated groundwater annually to the City of Norco (DWR, 2010).

3.5.5 Water Conservation

In the MWD Los Angeles Planning Area, MWD assists member agencies with implementation of water conservation programs. MWD's conservation programs focus on two main areas: residential programs, and commercial, industrial and institutional programs.

Water conservation continues to be a key factor in water resource management in southern California. For MWD, water-use efficiency is anchored by the adopted Long-Term Conservation Plan (LTCP) (August 2011) and the Local Resources Program (LRP). The LTCP sets goals to help retailers achieve water conservation savings, and at the same time, support technology innovation and transform public perception about the value of water. This plan is market oriented and has both incentive and non-incentive drivers to ultimately change how water is used by southern California consumers. Additionally, the LRP encourages the development and increased use of recycled water through incentives (MWD, 2012).

Outdoor water use is a key focus as watering landscapes and gardens accounts for about half of household water use in MWD's service area. MWD will work with water agencies, landscape equipment manufacturers and other stakeholders to make proper irrigation control more effective and easier to understand. A similar effort will be made to reach out to the region's businesses, industries and agriculture to focus on process improvements that can save both money and water. The final focus will be on residential water use, where MWD will work with water agencies and energy utilities to better promote the choices that consumers have for water-efficient products like faucets, shower heads and high-efficiency clothes washers (MWD, 2012).

MWD's incentive programs aimed at residential, commercial and industrial water users make a key contribution to the region's conservation achievements. The rebate program is credited with water savings of 156,000 acre-feet annually. Funding provided by MWD to member agencies and retail water agencies for locally-administered conservation programs included rebates for turf removal projects, toilet distribution and replacement programs, high-efficiency clothes washer rebate programs and residential water audits (MWD, 2012).

3.5.5.1 Residential Programs

MWD's residential conservation consists of the following programs:

- SoCal Water$mart: A region-wide program to help offset the purchase of water-efficient devices. MWD issued 54,000 rebates for residential fixtures in fiscal year 2008/09, resulting in approximately 2.3 thousand acre-feet of water to be saved annually.
- Save Water, Save A Buck: This program extends rebates to multi-family dwellings. More than 40,000 rebates were issued fiscal year 2008/09 for high-efficiency toilets and washers for multi-family units.
- Member Agency Residential Programs: member and retail agencies also implement local water conservation programs within their respective service areas

and receive MWD incentives for qualified retrofits and other water-saving actions. Typical projects include toilet replacements, locally administered clothes washer rebate programs, and residential water audits.

MWD has provided incentives on a variety of water efficient devices for the residential sector, including: 1) high-efficiency clothes washers; 2) high-efficiency toilets and ultra-low toilets; 3) irrigation evaluations and residential surveys; 4) rotating nozzles for sprinklers; 5) weather-based irrigation controllers; and, 6) synthetic turf.

3.5.5.2 Commercial, Industrial and Institutional Programs

MWD's commercial industrial and institutional conservation consists of three major programs:

- Save Water, Save-A-Buck Program: The Save-A-Buck program had its largest year in fiscal year 2008/09, providing rebates for approximately 145,000 device retrofits.
- Water Savings Performance Program: This program allows large-scale water users to customize conservation projects and receive incentives for five years of water savings for capital water-use efficiency improvements
- Member Agency Commercial Programs: Member and retail agencies also implement local commercial water conservation programs using MWD incentives.

A fourth program, the Public Sector Demonstration Program also resulted in water savings. From August 2007 through 2008, MWD offered a one-time program to provide up-front funding to increase water use efficiency in public buildings and landscapes within its service area. Participants included various special districts, school districts, state colleges and universities, municipalities, counties, and other government agencies.

- Enhanced incentives were provided to replace high water-use equipment including toilets, urinals, and irrigation controllers. Program incentives were often sufficient to cover the total cost of the equipment.
- Pay-for-performance incentives were also offered to reduce landscape irrigation water use by at least 10 percent through behavioral modifications.
- MWD' s programs provide rebates for water-saving plumbing fixtures, landscaping equipment, food-service equipment, cleaning equipment, HVAC (heating, ventilating, air conditioning) and medical equipment (MWD).

LADWP implements public outreach and school education programs to encourage conservation ethics; seasonal water rates that are approximately 20 percent greater during the summer high use period; and free water conservation kits. In addition, LADWP implemented Mandatory Water Conservation measures in 2009, which are still in effect today. Mandatory Water Conservation restricts outdoor watering and prohibits certain uses of water such as prohibiting customers from hosing down driveways and sidewalks, requiring all leaks to be fixed, and requiring customers to use hoses fitted with shut-off nozzles. As a result of these conservation efforts by LADWP, the water demand for Los

Angeles is about the same as it was 25 years ago, despite a population increase of more than one million people. LADWP projects an additional savings of at least 50,000 acre-feet per year by 2030 through additional water conservation programs. The Central Basin Municipal Water District and the WBMWD recently completed water conservation master plans to coordinate and prioritize conservation efforts and identify enforcement protocols (DWR, 2010).

OCWD implements several water use efficiency programs in the Santa Ana Planning Area, including a hotel/motel water conservation program, an annual Children's Water Festival, a Water Heroes program, and water saving tips and tools. Eastern Municipal Water District has a strategic goal to reduce per capita water use and has several programs to replace existing inefficient water devices and encourage water efficiency in new development. Inland Empire Utilities Agency provides multiple rebate programs, including turf removal and water efficient fixtures, and has established the Inland Empire Landscape Alliance to promote the use of water efficiency landscaping by its cities and retail agencies. Western Municipal Water District operates the preeminent water conservation demonstration center in the southland, Landscapes Southern California Style, which has been educating the public about water efficient planting and irrigation for over 15 years (DWR, 2010).

3.5.6 Water Quality

Water quality is a key issue in the South Coast region. Population and economic growth not only affect water demand, but add contamination challenges from increases in wastewater and industrial discharges, urban runoff, agricultural chemical usage, livestock operations, and seawater intrusion. Urban and agricultural runoff can contribute to local surface water sediment from disturbed areas; oil, grease, and toxic chemicals from automobiles; nutrients and pesticides from turf and crop management; viruses and bacteria from failing septic systems and animal waste; road salts; and heavy metals. Three areas that are receiving intense interest are nonpoint source pollution control, salinity management, and emerging contaminants (DWR, 2010).

Three Regional Water Quality Control Boards (Regional Water Boards) have jurisdiction in the South Coast: Los Angeles (Region 4), Santa Ana (Region 8), and San Diego (Region 9). Each Regional Water Board identifies impaired water bodies, establishes priorities for the protection of water quality, issues waste discharge requirements, and takes appropriate enforcement actions within in its jurisdiction. Specific water quality issues within the South Coast include beach closures, contaminated sediments, agricultural discharges, salinity management, and port and harbor discharges. Outside the region, high salinity levels and perchlorate contamination contribute to degraded Colorado River supplies, while seawater intrusion and agricultural drainage threaten SWP supplies (DWR, 2010).

3.5.6.1 Non-Point Source Pollution Control

All non-point source pollution is currently regulated through either the NPDES Permitting Program or the Coastal Non-point Pollution Control Program. The Regional Water Boards issue municipal, industrial, and construction NPDES permits with the goal of reducing or eliminating the discharge of pollutants into the storm water conveyance system. The coastal program requires the U.S. EPA and National Oceanic and Atmospheric Administration to develop and implement enforceable BMPs to control non-point source pollution in coastal waters. Further, the Los Angeles Regional Water Board has adopted conditional waivers for discharges from irrigated agricultural lands, which require farmers to measure and control discharges from their property (DWR, 2010).

South Coast agencies have recently begun to implement Low Impact Development (LID) as a way of improving water quality through sustainable urban runoff management. LID practices include: bioretention and rain gardens, rooftop gardens, vegetated swales and buffers, roof disconnection, rain barrels and cisterns, permeable pavers, soil amendments, impervious surface reduction, and pollution prevention. The Los Angeles and San Diego Regional Water Boards have both incorporated LID language into Standard Urban Storm Water Mitigation Plan requirements for municipal NPDES permits (DWR, 2010).

3.5.6.2 Salinity Management

Surface and groundwater salinity is an ongoing challenge for South Coast water supply agencies. Higher levels of treatment are needed following long-range import of water supplies, as TDS levels are increased during conveyance. Salinity sources in local supplies include concentration from agricultural irrigation, seawater intrusion, discharge of treated wastewater, and recycled water. MWD depends on blending the higher salinity CRA supply at Parker Dam with the lower salinity SWP supply to maintain 500 milligrams per liter (mg/L) TDS or lower. Further, seawater intrusion and agricultural drainage threatens to increase the salinity of SWP supplies. Reduced surface water quality would require additional or upgraded demineralization facilities. Increased salinity also reduces the life of plumbing fixtures and consequently increases replacement costs to customers (DWR, 2010).

Groundwater quality has also been degraded by a long history of groundwater overdrafting and subsequent seawater intrusion. Orange County Water District (OCWD), Water Replenishment District of Southern California (WRD), and Los Angeles County Department of Public Works (LACDPW) operate groundwater injection programs to form hydraulic barriers that protect aquifers from seawater intrusion. Brackish groundwater treatment occurs throughout the Santa Clara and Santa Ana planning areas. Various local agencies have developed salinity and nutrient management plans to reduce salt loading. For example, the Chino Basin Watermaster developed an Optimum Basin Management Plan (Chino Basin Watermaster, 1999) to develop the maximum yield of the basin while protecting water quality. Further development of groundwater recharge programs within the South Coast may exacerbate groundwater salinity and require additional technological advances in desalination (DWR, 2010).

3.5.6.3 Potential Contaminants

Chemical and microbial constituents that have not historically been considered as contaminants are increasingly present in the environment due to municipal, agricultural, and industrial wastewater sources and pathways. Established and emerging contaminants of concern to the region's drinking water supplies include pharmaceuticals and personal care products; disinfection byproducts; those associated with the production of rocket fuel such as perchlorate and nitrosodimethylamine; those that occur naturally such as arsenic; those associated with industrial processes such as hexavalent chromium and methyl tertiary butyl ether (MTBE). Wastewater treatment plants are not currently designed to remove these emerging contaminants (DWR, 2010).

3.5.6.4 Planning Area Impairments

Water quality issues within the MWD Los Angeles planning areas (Los Angeles Regional Water Board) stem from a range of sources, including industrial and municipal operations, flow diversion, channelization, introduction of non-native species, sand and gravel operations, natural oil seeps, dredging, spills from ships, transient camps, and illegal dumping. Over time, these practices have resulted in the bioaccumulation of toxic compounds in fish and other aquatic life, instream toxicity, eutrophication, beach closures, and a number of Clean Water Act 303(d) listings. Water bodies within this planning area have been listed for metals, pesticides, nitrates, trash, salinity, and pH. The Regional Water Board is developing TMDLs for nutrients, pathogens, trash, toxic organic compounds, and metals (DWR, 2010).

Key issues within the Santa Ana Planning Area (Santa Ana Regional Water Board) include: nitrogen/TDS due to flow diversion; nitrogen/TDS associated with past agricultural activities and dairies in the Chino Basin; and pathogen issues from urbanization impacting river and coastal beaches, and past contamination of groundwater basins from perchlorate which is related to rocket fuel disposal and fertilizer use. Water bodies within this planning area typically have nutrient issues, including organic enrichment, low dissolved oxygen, and algal blooms. These are particular problems in Big Bear Lake and Lake Elsinore. Water quality issues also include pathogens, metals, and toxic organic compounds in the lower watershed due to urbanization and agricultural activities. TMDLs have been developed throughout the Santa Ana River and San Jacinto River watersheds for nutrients and pathogens. Along the Newport coast, TMDLs are in place for metals, nutrients, pathogens, pesticides/priority organics, and siltation (DWR, 2010).

The Chino Basin maintains a large concentration of dairy operations along with livestock. Runoff from the dairies contributes nitrates, salts, and microorganisms to both surface water and groundwater. Since 1972, the Santa Ana Regional Water Board has issued waste discharge requirements to the dairies in this basin. Groundwater quality in this basin is integrally related to the surface water quality downstream in the Santa Ana River, which in turn serves as a source for groundwater recharge in Orange County.

3.5.7 Wastewater Treatment

The CWA requires wastewater treatment facilities discharging to waters of the U.S. to provide a minimum level of treatment commonly referred to as tertiary treatment. Modern wastewater treatment facilities consist of staged processes with the specific treatment systems authorized through NPDES permits. Primary treatment generally consists of initial screening and clarifying. Primary clarifiers are large pools where solids in wastewater are allowed to settle out over a period of hours. The clarified water is pumped into secondary clarifiers and the screenings and solids are collected, processed through large digesters to break down organic contents, dried and pressed, and either disposed of in landfills or used for beneficial agricultural applications. Secondary clarifiers repeat the process of the primary clarifiers further, refining the effluent. Other means of secondary treatment include flocculation (adding chemicals to precipitate solids removal) and aeration (adding oxygen to accelerate breakdown of dissolved constituents). Tertiary treatment may consist of filtration, disinfection, and reverse osmosis technologies. Chemicals are added to the wastewater during the primary and secondary treatment processes to accelerate the removal of solids and to reduce odors. Hydrogen peroxide can be added to reduce odors and ferric chloride can be used to remove solids. Polymers are added to secondary effluent as flocculate. Chlorine is often added to eliminate pathogens during final treatment and sulfur dioxide is often added to remove the residual chlorine. Methane produced by the treatment processes can be used as fuel for the plant's engines and electricity needs. Recycled water must receive a minimum of tertiary treatment in compliance with DHS regulations. Water used to recharge potable groundwater supplies generally receives reverse osmosis and microfiltration prior to reuse. Microfiltration technologies have improved substantially in recent years and have become more affordable. As levels of treatment increase, greater volumes of solids and condensed brines are produced. These by-products of water treatment are disposed of in landfills or discharged to local receiving waters.

Wastewater flows and capacities of major treatment facilities are shown in Table 3.5-5. Much of the urbanized areas of Los Angeles and Orange Counties are serviced by three agencies that operate large publicly owned treatment works (POTWs): the City of Los Angeles Bureau of Sanitation's Hyperion Treatment Plant in El Segundo, the City of Los Angeles Bureau of Sanitation's Terminal Island f~~F~~acility in San Pedro, ~~the Joint Outfall System of~~ the Los Angeles County Sanitation District's (LACSD) Joint Water Pollution Control Plant (JWPCP) in Carson, and the Orange County Sanitation District's (OCSD) treatment plants in Huntington Beach and Fountain Valley. These ~~three~~ facilities handle more than 70 percent of the wastewater generated in the entire SCAG region (SCAG, 2010).

In addition to these large facilities, medium sized POTWs (greater than 10 mgd) and small treatment plants (less than 10 mgd) service smaller communities in Ventura County, southern Orange County, and in the inland regions. Many of these treatment systems recycle their effluent through local landscape irrigation and groundwater recharge projects. Other treatment systems discharge to local creeks on a seasonal basis, effectively matching the natural conditions of ephemeral and intermittent stream habitats (SCAG, 2012).

Many rural communities utilize individually owned and operated septic tanks rather than centralized treatment plants. The RWQCB generally delegates oversight of septic systems to local authorities. However, water discharge requirements are generally required for multiple-dwelling units and in areas where groundwater is used for drinking water. These water discharge requirements are only issued to properties greater than one acre and are not required for properties greater than five acres in size (SCAG, 2012).

TABLE 3.5-5

Wastewater Flow and Capacity in the SCAG Region

WASTEWATER AGENCY	CURRENT FLOW (MGD)	CAPACITY FLOW (MGD)
Los Angeles County		
Los Angeles County Sanitation Districts		
Joint Water Pollution Control Plant~~Outfall System~~	406.1	590.2
Lancaster Water Reclamation Plant	12.0	16.0
Palmdale Water Reclamation Plant	8.0	15.0
Santa Clarita Water Reclamation Plant	20.0	28.6
City of Los Angeles	554.5	580.0
Las Virgenes Municipal Water District	9.5	16.0
City of Burbank	9.0	9.0
Orange County		
Orange County Sanitation District	221.0	699.0
Irvine Ranch Water District	12.3	23.5
South Orange County Wastewater Authority	26.5	37.7
El Toto Water District	5.4	6.0
Riverside County		
Eastern Municipal Water District	37.3	59.0
City of Riverside	36.0	40.0
Coachella Valley Water District	18.0	31.0
San Bernardino County		
Inland Empire Utilities Agency	60.0	84.0
City of San Bernardino	25.5	33.0
Victor Valley Wastewater Reclamation Authority	12.5	14.5
City of Redlands	6.0	9.5
Ventura County		
City of Oxnard	22.5	31.7
City of Simi Valley	10.0	12.5
City of Thousand Oaks	10.5	14.0
City of Ventura	9.0	12.0
Camarillo Sanitation District	4.0	7.3
Total	**1,535.6**	**2,369.5**

Source: SCAG, 2012

SUBCHAPTER 3.6

LAND USE AND PLANNING

Introduction

Regulatory Setting

Environmental Setting

3.6 LAND USE AND PLANNING

3.6.1 Introduction

The environmental setting describes the land uses that may be affected by the proposed project. The environmental setting addresses residential, commercial, industrial, and institutional land uses across the district.

3.6.2 Regulatory Setting

3.6.2.1 Federal Agencies

3.6.2.1.1 United States Bureau of Land Management (BLM)

The BLM manages much of the undeveloped or unused land in the region, primarily in the eastern portion of the region. The California Desert Conservation Area Plan is used to manage BLM controlled areas. The BLM also implements biological resource management policies through its designation of Areas of Critical Environmental Concern.

3.6.2.1.2 National Park Service (NPS)

The NPS manages national parks and wilderness areas. One national park and one wilderness area are located in the district: Joshua Tree National Park and the Santa Monica Mountains National Recreation Area.

3.6.2.1.3 United States Fish and Wildlife Service (USFWS)

The USFWS administers the Federal Endangered Species Act (FESA) and designates critical habitat for endangered species. The USFWS manages the National Wildlife Refuges in the district such as the Seal Beach National Wildlife Refuge and the Coachella Valley National Wildlife Refuge.

3.6.2.1.4 United States Forest Service (USFS)

The USFS manages approximately 2.3 million acres of national forests in the district. The three national forests in the region are the Angeles National Forest, San Bernardino National Forest, and the Cleveland National Forest.

3.6.2.1.5 United States Army Corps of Engineers (USACOE)

Among its responsibilities, the USACOE administers §404 of the Clean Water Act (CWA), which governs specified activities in waters of the United States, including wetlands. In this role, the USACOE requires that a permit be obtained if a project would place structures, including dredged or filled materials, within navigable waters or wetlands, or result in alteration of such areas.

3.6.2.1.6 U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)

The NRCS maps soils and farmland uses to provide comprehensive information necessary for understanding, managing, conserving and sustaining the nation's limited soil resources. The NRCS manages the Farmland Protection Program, which provides funds to help purchase development rights to keep productive farmland in agricultural uses.

3.6.2.2 State Agencies

3.6.2.2.1 California Department of Conservation

In 1982, the State of California created the Farmland Mapping and Monitoring Program within the California Department of Conservation to carry on the mapping activity from the NRCS on a continuing basis. The California Department of Conservation administers the California Land Conservation Act of 1965, also known as the Williamson Act, for the conservation of farmland and other resource-oriented laws.

3.6.2.2.2 California Coastal Commission

The California Coastal Commission plans for and regulates development in the coastal zone consistent with the policies of the California Coastal Act. The Commission also administers the federal Coastal Zone Management Act in California. As part of the Coastal Act, cities and counties are required to prepare a local coastal program (LCP) for the portion of its jurisdiction within the coastal zone. With an approved LCP, cities and counties control coastal development that accords with the local coastal plan. If no local coastal plan has been approved, the Coastal Commission controls coastal development.

3.6.2.2.3 California Department of Transportation (Caltrans)

The Caltrans jurisdiction includes rights-of-way of state and interstate routes within California. Any work within the right-of-way of a federal or state transportation corridor is subject to Caltrans regulations governing allowable actions and modifications to the right-of-way. Caltrans includes the Division of Aeronautics, which is responsible for airport permitting and establishing a county Airport Land Use Commission (ALUC) for each county with one or more public airports. ALUCs are responsible for the preparation of land use plans for areas near aviation facilities.

3.6.2.2.4 California Department of Forestry and Fire Protection (CDF)

The CDF reviews and approves plans for timber harvesting on private lands. In addition, through its responsibility for fighting wildland fires, the CDF plays a role in planning development in forested areas.

3.6.2.2.5 California Department of Parks and Recreation (CDPR)

The CDPR manages and provides sites for a variety of recreational and outdoor activities. The CDPR is a trustee agency that owns and operates all state parks and participates in land use planning that affects state parkland.

3.6.2.2.6 California Department of Fish and Game (CDFG)

The land use mandate of the CDFG is to protect rare, threatened, and endangered species by managing habitat in legally designated ecological reserves or wildlife areas. CDFG reserves located in the district include the Bolsa Chica Ecological Reserve (Orange County), among others.

3.6.2.3 Regional and Local

3.6.2.3.1 Southern California Association of Governments (SCAG)

Related to land use, SCAG is authorized to undertake intergovernmental review for federal assistance and direct federal development pursuant to Presidential Executive Order 12,372. Pursuant to CEQA (Public Resource Code §21083 and §21087 and CEQA Guidelines §15206 and §15125 (b), SCAG reviews projects of regional significance for consistency with regional plans. SCAG is also responsible for preparation of the Regional Housing Needs Assessment (RHNA), pursuant to California Government Code Section 65584 (a). SCAG's RHNA provides a tool for providing local affordable housing development strategies.

The 2012–2035 *Regional Transportation Plan/Sustainable Communities Strategy* (2012–2035 RTP/SCS) provides a blueprint for improving quality of life for the residents of SCAG's area of jurisdiction, which includes the district, by providing a variety of choices regarding where they will live, work, and play, and how they will move around. Further, safe, secure, and efficient transportation systems is expected to provide improved access to opportunities, such as jobs, education, and healthcare.

3.6.2.3.2 Local Agency Formation Commissions

The Local Agency Formation Commission (LAFCO) is the agency in each county that has the responsibility to create orderly local government boundaries, with the goal of encouraging "planned, well-ordered, efficient urban development patterns," the preservation of open-space lands, and the discouragement of urban sprawl. While LAFCOs have no direct land use authority, their actions determine which local government will be responsible for planning new areas. LAFCOs address a wide range of boundary actions, including creation of spheres of influence for cities, adjustments to boundaries of special districts, annexations, incorporations, detachments of areas from cities, and dissolution of cities.

3.6.2.3.3 General Plans

The most comprehensive land use planning for the district is provided by city and county general plans, which local governments are required by state law to prepare as a guide for future development. General plans contain goals and policies concerning topics that are mandated by state law or which the jurisdiction has chosen to include. Required topics are land use, circulation, housing, conservation, open space, noise, and safety. Other topics that local governments frequently choose to address include air quality, public facilities, parks and recreation, community design, sustainability and growth management, among others. These plans provide general definitions and implementation methods for each land use designation in the district. City and county general plans must be consistent with each other. County general plans must cover areas not included by city general plans (e.g., unincorporated areas).

3.6.2.3.4 Specific and Master Plans

A city or county may also provide land use planning by developing community or specific plans for smaller, more specific areas within their jurisdiction. These more localized plans provide for focused guidance for developing a specific area, with development standards tailored to the area, as well as systematic implementation of the general plan.

3.6.2.3.5 Zoning and Land Use Permits

City and county zoning codes are the set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies which uses are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan. Cities and counties typically implement their zoning codes through highly individualized land use ordinances that differ from jurisdiction to jurisdiction.

3.6.3 Environmental Setting

The district is comprised of the non-desert portion of Los Angeles County, all of Orange County, a portion of southwestern San Bernardino County, and the Salton Sea Air Basin and Mojave Desert Air Basin portions of Riverside County amounting to a jurisdiction of approximately 10,473 square miles and a population of approximately 17 million. Bounded by the Pacific Ocean to the west; the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east; and San Diego and Imperial Counties to the south, the district contains a vast network of cities and towns, ranging from small rural developments of a few thousand residents to bustling metropolitan centers of several million residents, interspersed between large expanses of open space and undeveloped land.

Urban development in the district tends to cluster around a well-defined network of state and federal highways which connect the regional populations of the district with other regions in California and across the nation. While most urban development has historically been based in the coastal regions of Los Angeles County and Orange County, there has been considerable urban growth eastward to the mountain and valley regions of Riverside County and San Bernardino County. Downtown Los Angeles is the largest urbanized center within the district. Other urbanized areas in Los Angeles County include Long Beach, Burbank, Glendale, Pasadena and Pomona. Office-based commercial centers have emerged in

Woodland Hills, Universal City, Westwood, around Los Angeles International Airport, and Century City. In the other three counties within the district, urban centers exist in the cities of Riverside, San Bernardino, Santa Ana, Anaheim, and Irvine. Much of the development in Riverside and San Bernardino Counties has taken place within unincorporated county land that both counties possess. Riverside County, in particular, has developed the Riverside County Integrated Project, which seeks to improve the quality of life for its citizens through a complementary array of development projects and programs aimed at creating a balanced and sustainable environment. As a result of Riverside County's efforts, the valley and mountain regions of the County have quickly developed over the past 20 years from small rural settlements to relatively large suburban commuter cities.

Within the older cities and communities in the district, development has taken more of a revitalization outlook. Without a vast surplus of open space, developers in Los Angeles County and Orange County have turned to different types of housing and commercial developments, including townhouses, condominiums, apartments, and mixed-use developments that combine commercial and office uses. Older buildings are often renovated or converted to accommodate new residential or commercial uses, and land use patterns in major developed cities have generally shifted from the traditional single-use pattern to more of a mixed use approach, where residential and commercial land uses are often found adjacent to one another, or within the same building.

Land uses across the district can typically be categorized into six general categories -- residential, commercial, industrial, institutional, open space and agricultural. Agricultural is discussed separately in Section 3.2.

3.6.3.1 Los Angeles County

3.6.3.1.1 Residential

Los Angeles County is the most populated and economically robust region in the district. As a result, high demand for housing is a consistent concern for the County. Residential land use patterns in the County, as well as the district, are dependent upon geography. Major concentrations of residential uses are found in the Los Angeles Basin, which is bounded on the north by the transverse mountain ranges of the Santa Monica Mountains and the San Gabriel Mountains. From the foothills of the transverse mountain ranges, large urban and sub-urban cities blanket the Los Angeles Basin southward to the Santa Ana Mountains and the Orange County Coast, and eastward to the San Bernardino Mountains. The County contains most of the high and medium density housing in the district, which is concentrated primarily in urban and sub-urban population centers, such as Downtown Los Angeles, East Los Angeles, Glendale, Burbank, and Long Beach. Surrounding these population centers are lower density suburbs located on the eastern and southern reaches of Los Angeles County and extending into Orange County and San Bernardino County. With the Los Angeles Basin almost completely built-out, the County is now in the process of directing residential land uses, population growth, and residential density to urbanized areas and promoting infill development to minimize sprawl and encourage sustainable growth (Los Angeles County Department of Regional Planning, 2012).

3.6.3.1.2 *Commercial*

In the same way that residential land use patterns are related to geography, commercial land use patterns tend to form around transportation facilities, such as highways, rail lines, and airports, particularly around major freeway intersections. Downtown Los Angeles, bounded in all directions by four different freeways, is the largest commercial and business center in the district, providing jobs to residents across the district. The County also projects tremendous employment growth in northern Los Angeles County as housing and transportation development continues northward.

3.6.3.1.3 *Industrial*

The largest concentration of industrial land uses and activities in the district is provided by the adjacent Ports of Los Angeles and Long Beach. Combined, the San Pedro Bay Ports anticipate cargo volumes to grow to 43 million twenty-foot equivalent unit containers by year 2035 – more than tripling from current levels (Los Angeles County Department of Regional Planning, 2012). Further, these adjacent ports handle approximately 40 percent of the volume imported into the country and approximately 24 percent of the nation's exports (SCAG, 2012). From the ports, industrial activity can be traced along cargo rail lines and major interstate highways, such as Route 110[1] and Interstate 710 (I-710), north to downtown Los Angeles and east to the Cities of Industry and Commerce. Significant air cargo and associated industrial land uses also are located around Los Angeles International Airport. Oil extraction and refining industries are also found in northern Los Angeles County near the City of Santa Clarita and in southern Los Angeles County surrounding the City of Long Beach.

3.6.3.1.4 *Institutional*

Institutional land uses, which include large government and private operations, such as military bases, airports, and universities, encompass a considerable footprint in the district. In the Antelope Valley, a large portion of land is dedicated to airport uses at Palmdale Airport, while Los Angeles International Airport (LAX) is the largest airport land use. Bob Hope Airport and Long Beach Airport are the other commercial airports in Los Angeles County. In addition, the Los Angeles Air Force Base, located just south of LAX is the major military land use in the County. University and college campuses are located in every county of the district, the largest of which are part of the University of California system. In Los Angeles County, the University of California, Los Angeles (UCLA), California Polytechnic University at Pomona and the University of Southern California are some of the largest universities. There are also numerous California State Universities (Northridge and Los Angeles), as well as community colleges located throughout the County.

[1] Route 110, consists of two segments of State Route 110 (SR-110) joined by Interstate 110 (I-110). The entire length of I-110 (which ends at I-10), as well as SR-110 south of the Four Level Interchange with US Highway (US 101), is the Harbor Freeway, and SR-110 north from US 101 to Pasadena is the historic Arroyo Seco Parkway. The entire Route 110 connects San Pedro and the Port of Los Angeles with Downtown Los Angeles and Pasadena.

3.6.3.1.5 Open Space

Over half of the total geography of Los Angeles County is comprised of open space and rural land. Most rural land is located in the Palmdale – Lancaster desert region, which is just northeast of the district's boundaries. Most of the open space in the County is composed of the Angeles National Forest, which covers the entire northern region of the district. This land is administered by the National Forest Service and provides mainly outdoor recreation and wilderness conservation functions. Other major open space areas can be found in the Santa Monica Mountains and the Whittier Narrows located in the Puente Hills.

3.6.3.2 Orange County

Orange County is comprised of 34 cities (County of Orange Resources and Development Management Department, 2005) and also contains unincorporated areas. Orange County has an estimated population of 3,055,792 residents as of January 1, 2012 (California Department of Finance, 2012). Each of the 34 cities has its own General Plan while the unincorporated areas are covered by the Orange County General Plan. The Orange County General Plan states as its first policy that urban land uses within the County must be planned with a balanced mix of residential, commercial, industrial and public land uses. ~~Orange County comprises 34 cities (County of Orange Resources and Development Management Department, 2005) and has an estimated population of 3,055,792 residents as of January 1, 2012 (California Department of Finance, 2012).~~

3.6.3.2.1 Residential

In Orange County, residential development follows the coastline and is limited from inland expansion by the Santa Ana Mountains and the Cleveland National Forest (SCAG, 2012). The major population centers in northern Orange County are the Cities of Huntington Beach, Garden Grove, and Fullerton, which tend to be extensions of housing and commercial development from southern Los Angeles County, catering to a large commuter population. From these border cities, high and medium density housing development continues south through the major commercial cities of Anaheim, Santa Ana, and Orange. To the south of these cities are the Cities of Costa Mesa, Newport Beach, Irvine, Lake Forest, and Laguna Niguel, which are less densely populated with primarily single-family medium to low density housing developments. As such, residential land uses in the County can be described as following a similar pattern to that of Los Angeles County, where the major urban and sub-urban population centers align themselves with transportation resources, particularly Interstate 5 (I-5), and natural features, such as the "South Coast" and the Santa Ana Mountains.

3.6.3.2.2 Commercial

Commercial land use in the County is divided into two types of designations: community commercial and regional commercial land uses. Community commercial land uses include general commercial facilities providing convenience goods and retail trade to individual communities of 20,000 persons (County of Orange Resources and Development Management Department, 2005). Each city has its own community commercial developments, mainly located along major arterial highways such as I-5, Interstate 405 (I-405), State Route 22 (SR-22), State Route 55 (SR-55), and Beach Boulevard, also known as State Route 39 (SR-39). Regional commercial land uses are of a higher intensity and serve a larger regional population usually in the form of malls, such as the South Coast Plaza in Costa Mesa and commercial office buildings. Orange County's commercial office activity is within close proximity to the intersection of I-5, SR-22, and State Route 57 (SR-57). ~~known as the "Orange Crush,"~~ An additional commercial area in Orange County, the Irvine Business Complex (IBC), is the area surrounding John Wayne Airport~~,~~ and ~~the area surrounding~~ the University of California, at Irvine (UCI). ~~known as the Irvine Spectrum.~~ Ano~~O~~ther major commercial office area ~~centers~~ in Orange County, the Irvine Spectrum, is ~~include~~ the area surrounding the "El Toro Y", which is the intersection of I-5 and I-405 freeways ~~, known as the "El Toro Y"~~ (SCAG, 2012a).

3.6.3.2.3 Industrial

Relative to the district, Orange County has few industrial land uses. In fact, the Orange County~~'s~~ General Plan, which only applies to unincorporated areas within Orange County, does not distinguish industrial land uses from other employment providing land uses (SCAG, 2012a). Fifty years ago, Orange County was primarily agricultural and the major industries were based in supporting the rich farming resources of the County. Today, much of Orange County's industrial land uses are located along the coast and focused on oil extraction and refining, while most income in the County is provided by technical, aerospace, and information industries which are typically higher-paid white collar industries set in commercial office areas.

3.6.3.2.4 Institutional

The major military land uses in the County are the Seal Beach Naval Weapons Station and Los Alamitos Reserve Air Station. In addition, institutional land uses also include universities, such as UCI and California State University at Fullerton, John Wayne Airport, and three active regional landfills.

3.6.3.2.5 Open Space

The unincorporated territories of the County, consisting of approximately 321 square miles, are geographically diverse and spread throughout the County. The largest portion of unincorporated territory is mostly open space found in southeastern Orange County and includes the Cleveland National Forest, a number of planned communities, such as Coto de Caza, Las Flores, and Ladera Ranch, as well as large portions of undeveloped territory south of the Ortega Highway (SCAG, 2012a). In addition, the Orange County Sustainable Communities Strategy identifies the preservation/open space programs located throughout all of Orange County, including the individual efforts of the County of Orange and the 34 local jurisdictions.

3.6.3.3 Riverside County

3.6.3.3.1 Residential

In Riverside County, residential land uses are mainly located in the western valley portion of the county and makes up approximately 288 square miles of County land, of which 57 percent is located in unincorporated areas (Riverside County, 2003). Medium to high density residential developments can be found in northwestern Riverside County mainly in the two major Cities of Riverside and Corona. Farther inland, beginning in the Coachella Valley, the County is comprised almost entirely of low density or rural housing. Much of the development in Riverside County has been on unincorporated county land. Areas that were rural twenty years ago are quickly becoming suburban. Riverside County adopted the County General Plan that strives to create a high quality, balanced, and sustainable environment for the citizens of Riverside (SCAG, 2012a).

3.6.3.3.2 Commercial

Commercial land uses account for approximately 15,675 acres of county land, and commercial development is generally less vigorous and on a smaller scale than in Los Angeles County or Orange County (Riverside County, 2003). Commercial office developments would typically be found in the downtown areas of major cities, such as the City of Riverside. Other commercial developments in the County are typically large regional retail and convenience shopping centers typically located in major cities or along major highways such as Interstate 215 (I-215) and Interstate 10 (I-10).

3.6.3.3.3 Industrial

A total of over 24,000 acres of the County are devoted to industrial uses, which may include heavy industry, warehousing, and mineral extraction. With the exception of land devoted to mineral extraction (89 percent of which is within unincorporated territories), the majority of industrial land is located within the cities of Riverside County. The major industries within the County are agricultural and mineral extraction industries, most of which are located in eastern Riverside County in the Coachella Valley and Salton Sea Basin. Recently, manufacturing industries, distribution centers, and warehouses have established businesses in Riverside County making it a major distribution center for goods in the region, as well as the state. Riverside County also houses a major wind energy generation site in the San Gorgonio Pass and the County should be poised for further development of wind, solar, and other green energies in the eastern portion of the County.

3.6.3.3.4 Institutional

Approximately 106 square miles of land are devoted to various public facilities (utilities, schools, government offices, police and fire facilities, correctional facilities, military installations, museums, convention centers, libraries, theater facilities, rehabilitation facilities, short-and long-term custodial facilities, cemeteries, etc.) through the County. Major military uses include the Naval Warfare Assessment Station in Corona and the Chocolate Mountains Aerial Gunnery Range. Other major institutional land uses are Palm

Springs International Airport, March Inland Port, and the University of California at Riverside.

3.6.3.3.5 Open Space

A vast amount of land (1,313,073 acres or 28 percent of the county total) consists of open space use and provides for recreation, agriculture, scientific opportunity, and wild land preservation. The majority of open space in the County is located in eastern portion of the county in the Coachella Valley (part of the Salton Sea Air Basin and the Mojave Desert Air Basin, which house mostly agricultural and mineral extraction operations usually administered by the Bureau of Land Management and the California Department of Conservation. The largest major open space use in the County is the Joshua Tree National Park, which is administered by the National Parks Service and provides a variety of recreation and wild land preservation functions. Other major open space uses include Mount San Jacinto State Park, the Coachella Valley National Wildlife Refuge, the southern reaches of the San Bernardino National Forest, and numerous golf courses located throughout the Coachella Valley and southern Riverside County.

3.6.3.4 San Bernardino County

3.6.3.4.1 Residential

Similar to Riverside County, residential land use in San Bernardino County is mainly concentrated in the western valley and high-desert region; however, the unincorporated areas of the desert and mountain regions are populated with dispersed low-density rural residences. The portion of San Bernardino County located within the district, also known as the Valley Region, is perhaps the most densely populated portion of the County as the two largest cities in the County, San Bernardino and Ontario, are both located in this region. Almost half of the 51,766 acres of unincorporated County land in the Valley Region is existing single and multifamily residential uses, occupying 24,236 acres (County of San Bernardino, 2007). Most of the residential uses in the Valley Region are medium to low density uses mostly located in the major cities of the region.

3.6.3.4.2 Commercial

Commercial uses occupy almost 2,155 acres of the Valley Region (County of San Bernardino, 2007). The Valley Region can be characterized as the center for commerce in the County while the Desert Region assumes the role of industrial leader. Like other regions in the district, commercial land uses in San Bernardino County portion of the district tend to be retail and convenience shopping uses with some commercial office buildings located in downtown areas. Commercial uses follow similar land use patterns, usually located along major transportation corridors such as Interstate 15 (I-15), I-215, and State Route 60 (SR-60).

3.6.3.4.3 Industrial

The Valley Region has nearly 5,155 acres of industrial uses (County of San Bernardino, 2007). While most of San Bernardino County is geared toward agricultural and mineral extraction industries, the Valley Region is geared toward supporting the Los Angeles County and Orange County economies. Like Riverside County, western San Bernardino County has become a major distribution point for the region with many manufacturing and warehouse facilities being built throughout the County. Adding to the goods coming by highway and rail through San Bernardino County are goods coming to the county by air through several airports that cater to air cargo, primarily Ontario International Airport.

3.6.3.4.4 Institutional

Institutional land uses in the Valley Region account for 2,875 acres of the region and are limited when compared to the rest of the County, which houses numerous military facilities in its Desert Region (County of San Bernardino, 2007). Accordingly, the Valley Region does include the San Bernardino International Airport and the Ontario International Airport, as well as California State University at San Bernardino.

3.6.3.4.5 Open Space

While San Bernardino County has the largest amount of open space and mineral resource conservation areas, the Valley Region contains very few of these land uses. The single major open space land use in the San Bernardino County portion of the district is the San Bernardino National Forest, which forms the northern and eastern boundaries of the Valley Region.

SUBCHAPTER 3.7

NOISE

3.7 NOISE

3.7.1 Introduction

The environmental setting section describes the noise, and noise sources in the Basin, which includes Orange County and portions of Los Angeles, Riverside and San Bernardino Counties.

Sound waves, traveling outward from a source, exert a sound pressure level (commonly called "sound level"), measured in decibels (dB). "Noise" is often defined as unwanted sound, and environmental noise is usually measured in "A-weighted" decibels, which is a decibel corrected for the variation in frequency response of the typical human ear at commonly-encountered noise levels. All noise levels discussed herein reflect A-weighted decibels. In general, people can perceive a two- to three-dB difference in noise levels; a difference of 10 dB is perceived as a doubling of loudness.

3.7.2 Regulatory Setting

The federal government sets noise standards for transportation-related noise sources that are closely linked to interstate commerce, such as aircraft, locomotives, and trucks, and, for those noise sources, the state government is preempted from establishing more stringent standards. The state government sets noise standards for those transportation noise sources that are not preempted from regulation, such as automobiles, light trucks, and motorcycles. Noise sources associated with industrial, commercial, and construction activities are generally subject to local control through noise ordinances and general plan policies.

3.7.2.1 Federal Agencies and Regulations

3.7.2.1.1 Code of Federal Regulations (CFR)

Federal regulations for railroad noise are contained in 40 CFR Part 201 and 49 CFR Part 210. The regulations set noise limits for locomotives and are implemented through regulatory controls on locomotive manufacturers.

Federal regulations also establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 CFR Part 205, Subpart B. The federal truck pass-by noise standard is dB at 15 meters from the vehicle pathway centerline. These controls are implemented through regulatory controls on truck manufacturers. The Federal Highway Administration (FHWA) regulations for noise abatement must be considered for federal or federally-funded projects involving the construction of a new highway or significant modification of an existing freeway when the project would result in a substantial noise increase or when the predicted noise levels approach or exceed the "Noise Abatement Criteria."

Under the regulations, a "substantial increase" is defined as an increase in Equivalent Continuous Level (Leq) of 12 dB during the peak hour of traffic noise. The Leq provides a time weighted average of the noise measured. For sensitive uses, such as residences, schools, churches, parks, and playgrounds, the Noise Abatement Criteria for interior and exterior spaces is Leq 57 and 66 dB, respectively, during the peak hour of traffic noise.

3.7.1.1.2 Federal Transit Administration (FTA)

The Federal Transit Administration has prepared guidance noise and vibration impacts assessments for proposed mass transit projects: Transit Noise and Vibration Impact Assessment (U.S. FTA, 2006). The May 2006 version is the second edition of a guidance manual originally issued in 1995, which presented procedures for predicting and assessing noise and vibration impacts of proposed mass transit projects. The guidance is required to evaluate the noise and vibration impacts in environmental review process for project proponents seeking funding from FTA. All types of bus and rail projects are covered. The guidance contains procedures for assessing impacts at different stages of project development, from early planning before mode and alignment have been selected through preliminary engineering and final design. The focus is on noise and vibration impacts during operations, but construction impacts are also covered. The guidance describes a range of measures for controlling excessive noise and vibration.

3.7.2.1.3 Federal Aviation Administration (FAA)

Aircraft operated in the U.S. are subject to certain federal requirements regarding noise emissions levels. These requirements are set forth in Title 14 of the Code of Federal Regulations (14 CFR), Part 36. Part 36 establishes maximum acceptable noise levels for specific aircraft types, taking into account the model year, aircraft weight, and number of engines. Pursuant to the federal Airport Noise and Capacity Act of 1990, the FAA established a schedule for complete transition to Part 36 “Stage 3” standards by year 2000. This transition schedule applies to jet aircraft with a maximum takeoff weight in excess of 75,000 pounds and, thus, applies to passenger and cargo airlines but not to operators of business jets or other general aviation aircraft.

3.7.2.1.4 Federal Railroad Administration (FRA)

On March 24, 2009, the Federal Highway Administration (FHA) and the FTA final rule that modified FRA regulations to make certain changes mandated by the Safe, Accountable, Flexible, Efficient, Transportation, Equity Act: A Legacy for Users (SAFETEA-LU). The SAFETEA-LU prescribes requirements for environmental review and project decision making. This rule became effective April 23, 2009.

3.7.2.1.5 Department of Housing and Urban Development (HUD)

The noise regulation 24 CFR Part 51 Subpart B, Noise Abatement and Control presents the HUD noise program. Within the HUD Noise Assessment Guidelines, potential noise sources are examined for projects located within 15 miles of a military or civilian airport, 1,000 feet from a road or 3,000 feet from a railroad. HUD exterior noise regulations state that 65 dBA DNL noise levels or less are acceptable for residential land uses and noise levels exceeding 75 dBA DNL are unacceptable. HUD's regulations do not contain standards for interior noise levels. A goal of 45 decibels is set forth for interior noise and the attenuation requirements are based upon this level. HUD’s standards assume that internal noise levels would be met if exterior standard are met under standard construction practices.

3.7.2.1.6 Federal Vibration Policies

The FRA and FTA have published guidance relative to vibration impacts. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. The decibel notation, VdB, is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.

According to the FRA, fragile buildings can be exposed to groundborne vibration levels of 0.5 inches per second PPV without experiencing structural damage. The FTA has identified the human annoyance response to vibration levels as 80 VdB (U.S. FTA, 2006).

3.7.2.2 State Agencies and Regulations

3.7.2.2.1 California's Airport Noise Standards

The State of California's Airport Noise Standards, found in Title 21 of the California Code of Regulations, identify a noise exposure level of Community Noise Equivalent Level (CNEL) 65 dB as the noise impact boundary around airports. CNEL measurements are a weighted average of sound levels gathered throughout a 24-hour period. The noise between 7:00 p.m. and 10:00 p.m. is increased by five dB and the hours of 10:00 p.m. and 7:00 a.m. is increased by 10 dB. This takes into account the decrease in community background noise of during evening and nighttime hours.

Within the noise impact boundary, airport proprietors are required to ensure that all land uses are compatible with the aircraft noise environment or the airport proprietor must secure a variance from the California Department of Transportation.

3.7.2.2.2 California Department of Transportation (Caltrans)

The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the state pass-by standard is consistent with the federal limit of 80 dB. The state pass-by standard for light trucks and passenger cars (less than 4.5 tons gross vehicle rating) is also 80 dB at 15 meters from the centerline. For new roadway projects, Caltrans employs the Noise Abatement Criteria, discussed above in connection with the FHWA.

3.7.2.2.3 California Noise Insulation Standards

The California Noise Insulation Standards found in the California Code of Regulations, Title 24, set requirements for new multi-family residential units, hotels, and motels that may be subject to relatively high levels of transportation-related noise. For exterior noise, the noise insulation standard is DNL 45 dB in any habitable room and requires an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than DNL 60 dB. DNL is the average noise level over a 24 hour period. The noise between the hours of 10:00 p.m. and 7:00 a.m. is artificially increased by 10 dB. This takes into account the decrease in community background noise during nighttime hours.

3.7.2.2.4 State Vibration Policies

There are no adopted state policies or standards for ground-borne vibration. However, Caltrans recommends that extreme care be taken when sustained pile driving occurs within 7.5 meters (25 feet) of any building, and 15 to 30 meters (50 to 100 feet) of a historic building or a building in poor condition.

3.7.2.3 Local Agencies and Regulations

To identify, appraise, and remedy noise problems in the local community, each county and city within the district has adopted a noise element as part of its General Plan. Each noise element is required to analyze and quantify current and projected noise levels associated with local noise sources, including, but not limited to, highways and freeways, primary arterials and major local streets, rail operations, air traffic associated with the airports, local industrial plants, and other ground stationary sources that contribute to the community noise environment. Beyond statutory requirements, local jurisdictions are free to adopt their own goals and policies in their noise elements, although most jurisdictions have chosen to adopt noise/land use compatibility guidelines that are similar to those recommended by the state. The overlapping DNL ranges indicate that local conditions (existing noise levels and community attitudes toward dominant noise sources) should be considered in evaluating land use compatibility at specific locations.

In addition to regulating noise through noise element policies, local jurisdictions regulate noise through enforcement of local ordinance standards. These standards generally relate to noisy activities (e.g., use of loudspeakers and construction) and stationary noise sources and facilities (e.g., air conditioning units and industrial activities). Two cities within the district, Los Angeles and Long Beach, operate port facilities. Noise from the Ports of Los Angeles and Long Beach are regulated by the noise ordinances and noise elements of the Los Angeles and Long Beach General Plans.

In terms of airport noise, some of the actions that airport proprietors have been allowed to take to address local community noise concerns include runway use and flight routing changes, aircraft operational procedure changes, and engine run-up restrictions. These actions generally are subject to approval by the FAA, which has the authority and responsibility to control aircraft noise sources, implement and enforce flight operational procedures, and manage the air traffic control system

3.7.3 Environmental Setting

3.7.3.1 Noise Descriptors

Environmental noise levels typically fluctuate across time of day; different types of noise descriptors are used to account for this variability, and different types of descriptors have been developed to differentiate between cumulative noise over a given period and single noise events. Cumulative noise descriptors include the Leq, DNL, and CNEL. The Leq is the actual time-averaged, equivalent steady-state sound level, which, in a stated period, contains the same acoustic energy as the time-varying sound level during the same period. DNL and CNEL values result from the averaging of Leq values (based on A-weighted decibels) over a 24-hour period, with weighting factors applied to different periods of the day and night to account for their perceived relative annoyance. For DNL, noise that occurs during the nighttime period (10:00 p.m. to 7:00 a.m.) is "penalized" by 10 dB. CNEL is similar to DNL, except that it also includes a "penalty" of approximately five dB for noise that occurs during the evening period (7:00 p.m. to 10:00 p.m.). Cumulative noise descriptors, DNL and CNEL, are well correlated with public annoyance due to transportation noise sources. Table 3.12-1 shows the compatibility between various land uses and CNEL.

Individual noise events, such as train pass-bys or aircraft overflights, are further described using single-event and cumulative noise descriptors. For single events, the maximum measured noise level (Lmax) is often cited, as is the Sound Exposure Level (SEL). The SEL is the energy-based sum of a noise event of given duration that has been "squeezed" into a reference duration of one second and is typically a value that is five to 10 dB higher than the Lmax.

3.7.3.2 Vibration Measuring and Reporting

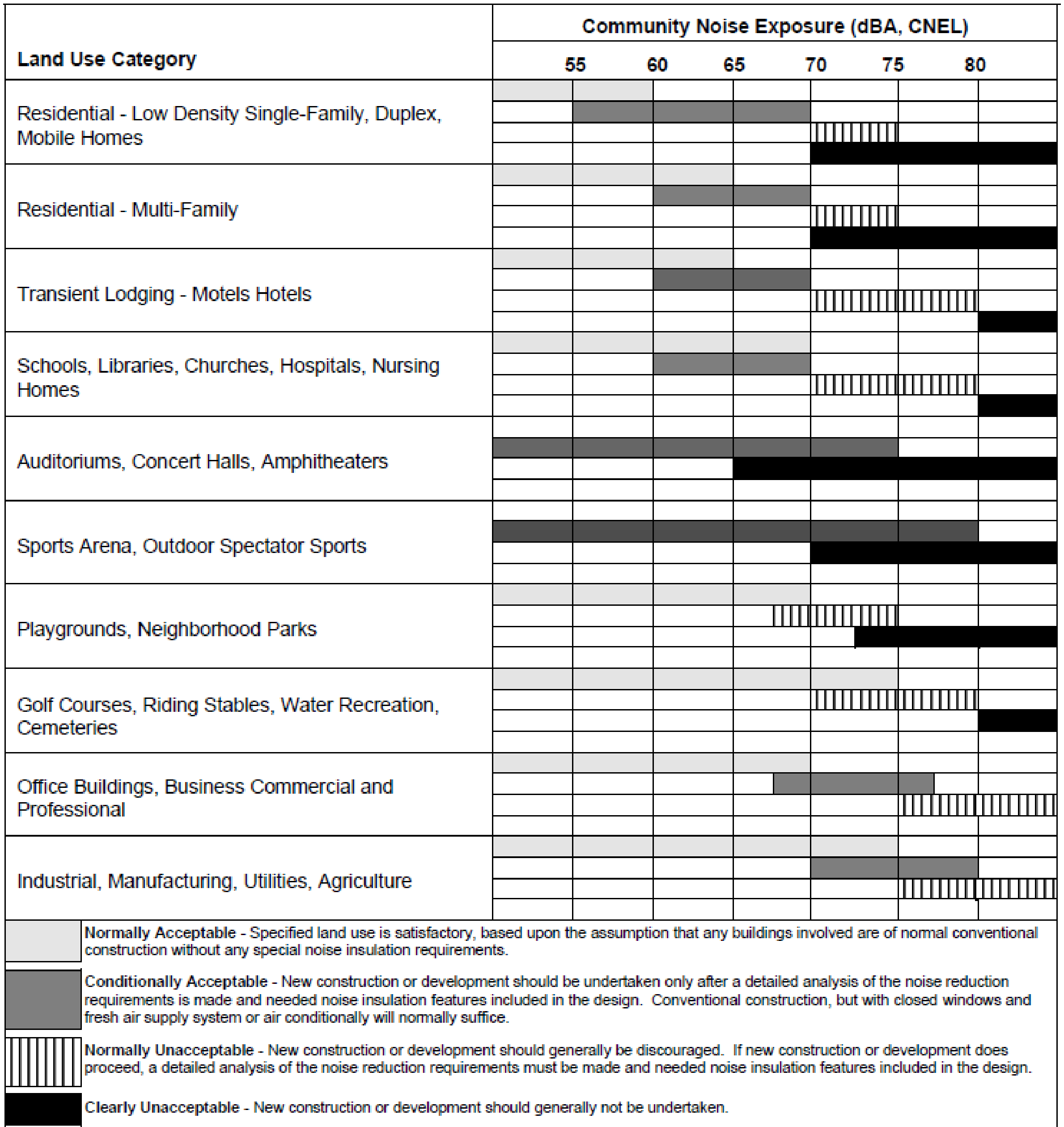
Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The FTA Assessment states that background vibration velocity levels in residential areas is usually 50 VdB or lower, well below the threshold of perception for humans which is around 65 VdB. The upper range for rapid transit vibration is around 80 VdB and the high range for commuter rail vibration is 85 VdB (U.S. FTA, 2006).

The FTA Assessment states that in contrast to airborne noise, ground-borne vibration is not a common environmental problem. Although the motion of the ground may be noticeable to people outside structures, without the effects associated with the shaking of a structure, the motion does not provoke the same adverse human reaction to people outside. Within structures, the effects of ground-borne vibration include noticeable movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. The maximum vibration amplitudes of the floors and walls of a building often will be at the resonance frequencies of various components of the building. However, the FTA Assessment states that noticeable vibration inside a building is typically caused by equipment or activities within the building itself, such as heating and ventilation systems, footsteps or doors closing.

FTA Assessment states that it is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. However, some common sources of vibration are trains, buses on rough roads, and construction activities, such as blasting, pile driving, and heavy earth-moving equipment.

TABLE 3.7-1

Noise Land Use Compatibility Matrix



SOURCE: California Office of Noise Control, Department of Health Services.

Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. Several different methods are used to quantify vibration. High levels of vibration may cause physical personal injury or damage to buildings. However, groundborne vibration levels rarely affect human health. Instead, most people consider groundborne vibration to be an annoyance that may affect concentration or disturb sleep. In addition, high levels of groundborne vibration may damage fragile buildings or interfere with equipment that is highly sensitive to groundborne vibration (e.g., electron microscopes).

3.7.3.3 Sensitive Receptors

Some land uses are considered more sensitive to ambient noise levels than others due to the amount of noise exposure (in terms of both exposure time and "insulation" from noise) and the types of activities typically involved. Residences, motels and hotels, schools, libraries, churches, hospitals, nursing homes, auditoriums, natural areas, parks and outdoor recreation areas are generally more sensitive to noise than are commercial and industrial land uses. Consequently, the noise standards for sensitive land uses are more stringent than those for less sensitive uses, such as commercial and industrial.

To protect various human activities and sensitive land uses (e.g., residences, schools, and hospitals) lower noise levels are needed. A noise level of 55 to 60 dB DNL outdoors is the upper limit for intelligible speech communication inside a typical home. In addition, social surveys and case studies have shown that complaints and community annoyance in residential areas begin to occur at 55 dB DNL. Sporadic complaints associated with the 55 to 60 dB DNL range give way to widespread complaints and individual threats of legal action within the 60 to 70 dB DNL range. At 70 dB DNL and above, residential community reaction typically involves threats of legal action and strong appeals to local officials to stop the noise.

3.7.3.4 Noise Sources

Many principal noise generators within the district are associated with transportation (e.g., airports, freeways, arterial roadways, seaports, and railroads). Additional noise generators include stationary sources, such as industrial manufacturing plants and construction sites. Local collector streets are not considered to be a significant source of noise since traffic volume and speed are generally much lower than for freeways and arterial roadways. Generally, transportation-related noise sources characterize the ambient noise environment of an area.

3.7.3.4.1 Airports

The Southern California Association of Governments (SCAG) region contains six established airports, including Los Angeles International (LAX), Bob Hope (formerly Burbank), John Wayne, Long Beach, Ontario, and Palm Springs. There are also four new and emerging airports in the Inland Empire and North Los Angeles County. These include San Bernardino International Airport (formerly Norton Air Force Base [AFB]), March Inland Port (joint use with March Air Reserve Base), Southern California Logistics Airport (formerly George AFB), and Palmdale Airport (joint use with Air Force Plant 42).

3.7.3.4.2 Freeways and Arterial Roadways

The SCAG region has over 20,717 centerline (route) miles and over 64,771 lane-miles of roadways, including one of the most extensive High-Occupancy Vehicle (HOV) lane systems in the country (U.S. FTA, 2006). Additionally, the SCAG region has a growing network of tolled lanes and High-Occupancy Toll (HOT) lanes. Regionally significant arterials provide access to the freeway system and often serve as parallel alternate routes; in some cases, they are the only major system of transportation available to travelers.

The extent to which traffic noise levels affect sensitive land uses depends upon a number of factors. These include whether the roadway itself is elevated above grade or depressed below grade, whether there are intervening structures or terrain between the roadway and the sensitive uses, and the distance between the roadway and such uses. For example, measurements show that depressing a freeway by approximately 12 feet yields a reduction in traffic noise relative to an at-grade freeway of seven to 10 dB at all distances from the freeway. Traffic noise from an elevated freeway is typically two to 10 dB less than the noise from an equivalent at-grade facility within 300 feet of the freeway, but beyond 300 feet, the noise radiated by an elevated and at-grade freeway (assuming equal traffic volumes, fleet mix, and vehicle speed) is the same (U.S. FTA, 2006).

Additionally, the SCAG region has an enormous number of arterial roadways. Typical arterial roadways have one or two lanes of traffic in each direction, with some containing as many as four lanes in each direction. Noise from these sources can be a significant environmental concern where buffers (e.g., buildings, landscaping, etc.) are inadequate or where the distance from centerline to sensitive uses is relatively small. Given typical daily traffic volumes of 10,000 to 40,000 vehicle trips, noise levels along arterial roadways typically range from 65 to 70 dB DNL at a distance of 50 feet from the roadway centerlines.

3.7.3.4.3 Railroad Operations

Railroad operations generate high, relatively brief, intermittent noise events. These noise events are an environmental concern for sensitive uses located along rail lines and in the vicinities of switching yards. Locomotive engines and the interaction of steel wheels and rails primarily generate rail noise. The latter source creates three types of noise: 1) rolling noise due to continuous rolling contact, 2) impact noise when a wheel encounters a rail joint, turnout or crossover, and 3) squeal generated by friction on tight curves. For very high speed rail vehicles, air turbulence can be a significant source of noise as well. In addition, use of air horns and crossing bell gates contribute to noise levels in the vicinity of grade crossings (U.S. FTA, 2006).

3.7.3.4.4 Freight Trains

Noise levels generated by freight train pass-by events reflect locomotive engine noise and rail car wheel rail interaction. The former depends upon track grade conditions (e.g., uphill versus downhill) and is largely independent of speed, whereas the latter is highly speed dependent, increasing approximately six dB for each doubling of train velocity (SCAG, 2008a). In addition to noise, freight trains also generate substantial amounts of ground-borne noise and vibration in the vicinity of the tracks. Ground-borne noise and vibration is a function of both the quality of the track and the operating speed of the vehicles.

The SCAG region has an extensive network of railroad lines belonging primarily to two major railroads: Union Pacific Railroad (Union Pacific) and Burlington Northern Santa Fe Railway (BNSF). SCAG's Inland Empire Railroad Main Line Study suggest that the number of freight trains on most BNSF and UP lines will more than double between 2000 and 2025 in response to a tripling of container volume at the San Pedro Bay Ports. A rail line supporting 40 freight trains per day generates approximately 75 dB DNL at 200 feet from the tracks. BNSF rail lines extend south from switching yards in eastern Los Angeles to the Los Angeles and Long Beach ports complex and east to Arizona and points beyond via San Bernardino County. BNSF generates approximately 75 dB DNL at a distance of 200 feet from the tracks (SCAG, 2008a).

3.7.3.4.5 Commuter and Inter-City Passenger Trains

In general, the noise generated by commuter rail facilities (powered by either diesel or electric locomotives) is from the locomotives themselves. In the district, there are two commuter and inter-city passenger train operators: AMTRAK and the Southern California Regional Rail Authority/Metrolink. AMTRAK operates trains with destinations in Seattle, Chicago, Orlando, San Diego, and San Luis Obispo. A typical AMTRAK pass-by event generates 107 dB SEL at 50 feet (SCAG, 2008a); two such events during the daytime or evening periods generate approximately 61 dB DNL at 50 feet and approximately 52 dB DNL at 200 feet. Nine such events generate approximately 67 dB DNL at 50 feet and 58 dB DNL at 200 feet.

The Southern California Regional Rail Authority operates the Metrolink commuter rail system. This system currently includes seven rail lines, with destinations in Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties. Noise levels generated by Metrolink are similar to those associated with AMTRAK.

3.7.3.4.6 Steel Wheel Urban Rail Transit

Heavy rail is generally defined as electrified rapid transit trains with dedicated guideway, and light rail as electrified transit trains that do not require dedicated guideway. In general, noise increases with speed and train length. Sensitivity to rail noise generally arises when there is less than 50 feet between the rail and sensitive receptors. A significant percentage of complaints about noise can be attributed to the proximity of switches, rough or corrugated track, or wheel flats. Within the district, the Los Angeles County Metropolitan Transit Authority (Metro) provides urban rail transit service on four lines within Los Angeles County. The Blue Line extends from Long Beach to the 7th Street Metro Center in downtown Los Angeles. The Red Line connects Union Station with North Hollywood via the Metro Center, the Gold Line connects Union Station with Pasadena, and the Green Line extends from Redondo Beach to Norwalk. Other Metro operated urban transit systems include the Orange Line which connects with the northern terminus of the Red Line in North Hollywood and serves much of the northwestern portion of Los Angeles County, and the Eastside Gold Line Extension, which provides rail transit service to East Los Angeles.

3.7.3.4.7 Port Operations

The Ports of Long Beach and Los Angeles are major regional economic development centers. These ports currently handle approximately 40 percent of the volume imported into the country and approximately 24 percent of the nation’s exports. Noise is generated from four sources: ships using the port facilities, equipment associated with cargo activity within the port, and truck and rail traffic moving cargo to and from the ports. All sources affect the ambient noise levels in the port areas. Residential areas in San Pedro (City of Los Angeles) and West Long Beach are affected most by truck and rail traffic related to the ports.

The Alameda Corridor provides a substantial long-term reduction in noise and vibration associated with rail operations in the vicinities of the Ports of Long Beach and Los Angeles. The Alameda Corridor consolidates the operations of UP and BNSF on 90 miles of existing branch line tracks into one 20-mile corridor along Alameda Street. This corridor provides a direct connection between the ports of Long Beach and Los Angeles and the UP and BSNF switching yards in eastern Los Angeles. The Alameda Corridor includes four overpasses and three underpasses at intersections south of State Route 91 (SR-91) that allow vehicles to pass above the trains. North of SR-91, trains pass through a 10-mile, 33-foot-deep trench. The construction of tracks in a below-grade trench, track construction on new base materials, and the use of continuous welded track reduce noise impacts on adjacent uses from freight trains associated with the ports. Also, the Alameda Corridor includes sound walls in certain locations to mitigate vehicle noise along Alameda Street in residential neighborhoods and other sensitive areas.

3.7.3.4.8 Industrial, Manufacturing, and Construction

Noise from industrial complexes, manufacturing plants, and construction sites are characterized as stationary, or point, sources of noise even though they may include mobile sources, such as forklifts and graders. Local governments typically regulate noise from industrial, manufacturing, and construction equipment and activities through enforcement of noise ordinance standards, implementation of general plan policies, and imposition of conditions of approval for building or grading permits.

Industrial complexes and manufacturing plants are generally located away from sensitive land uses, and, as such, noise generated from these sources generally has less effect on the local community. In contrast to industrial and manufacturing plants, construction sites are located throughout the region and are often located within, or adjacent to, residential districts. In general, construction activities generate high noise levels intermittently on and adjacent to the construction sites, and the related noise impacts are short-term in nature. The dominant source of noise from most construction equipment is the engine, usually a diesel engine, with inadequate muffling. However, in a few cases, such as impact pile driving or pavement breaking, noise generated that activity dominates. Construction equipment can be considered to operate in two modes, stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed-power operation (pumps, generators, compressors) or a variable noise operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion (bulldozers, loaders), or movement to and from the site (trucks) (SCAG, 2008a).

Construction-related noise levels generally fluctuate depending on the construction phase, equipment type and duration of use, distance between noise source and receptor, and presence or absence of barriers between noise source and receptor. Standard convention is that noise levels decrease by approximately six dB with each doubling of distance from the construction site (e.g., noise levels from excavation might be approximately 83 dB at 100 feet from the site, and so the noise level at 200 feet from the site would be about 77 dB). Interior noise levels from construction are approximately 10 dB (open windows) to 20 dB (closed windows) less than exterior noise levels due to the attenuation provided by building facades (SCAG, 2008a).

3.7.3.5 Existing Vibration Sources

Similar to the environmental setting for noise, the vibration environment is typically dominated by traffic from nearby roadways and activity on construction sites. Heavy trucks can generate groundborne vibrations that vary depending on vehicle type, weight, and road/pavement conditions. Heavy trucks typically operate on major streets. Nonetheless, vibration levels adjacent to roadways are typically not perceptible.

SUBCHAPTER 3.8

SOLID AND HAZARDOUS WASTE

Regulatory Background

Solid Waste Management

Hazardous Waste Management

3.8 SOLID AND HAZARDOUS WASTE

3.8.1 Regulatory Background

The Regulatory Background is divided into two sections: Solid Waste and Hazardous Waste.

3.8.1.1 Solid Waste

3.8.1.1.1 Federal

The U.S. EPA is the primary federal agency charged with protecting human health and with safeguarding the natural environment: air, water, and land. The U.S. EPA works to develop and enforce regulations that implement environmental laws enacted by Congress. The U.S. EPA is also responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Since 1970, Congress has enacted numerous environmental laws including RCRA, CERCLA, and the Toxic Substances Control Act (TSCA). 40 CFR Part 258, Subpart~~title~~ D of the RCRA establishes minimum location standards for siting municipal solid waste landfills. Because California laws and regulations governing the approval of solid waste landfills meet the requirements of Subtitle D, the U.S. EPA delegated the enforcement responsibility to the State of California.

3.8.1.1.2 State

With regard to solid non-hazardous wastes, the California Integrated Waste Management Act of 1989 (AB 939), as amended, requires every city and county in the state to prepare a Source Reduction and Recycling Element (SRRE) with its Solid Waste Management Plan that identifies how each jurisdiction will meet the mandatory state waste diversion goals of 25 percent by the year 1995, and 50 percent by the year 2000. Senate Bill 2202 (SB 2202) mandates that jurisdictions continue 50 percent diversion on and after January 1, 2000. The purpose of AB 939 is to facilitate the reduction, recycling, and re-use of solid waste to the greatest extent possible. Penalties for non-compliance with the goals and timelines set forth within AB 939 can be severe, since the bill imposes fines of up to $10,000 per day on cities and counties not meeting these recycling and planning goals (SCAG, 2012). AB 939 has recognized that landfills and transformation facilities are necessary components of any integrated solid waste management system and an essential component of the waste management hierarchy. AB 939 establishes a hierarchy of waste management practices in the following order and priority: 1) source reduction; 2) recycling and composting; and, 3) environmentally safe transformation/land disposal.

CalRecycle (formerly known as the California Integrated Waste Management Board) has numerous responsibilities in implementing the federal and state regulations summarized above. CalRecycle is the state agency responsible for permitting, enforcing and monitoring solid waste landfills, transfer stations, material recovery facilities (MRFs), and composting facilities within California. Permitted facilities are issued Solid Waste Facility Permits (SWFPs) by CalRecycle. CalRecycle also certifies and appoints Local Enforcement

Agencies (LEAs), county or city agencies which monitor and enforce compliance with the provisions of SWFPs. CalRecycle is also responsible for monitoring implementation of AB 939 by the cities and counties. In addition to these responsibilities, CalRecycle also manages the Recycled-Content Materials Marketing Program to encourage the use of specific recycled-content products in road applications, public works projects and landscaping. These products include recycled aggregate, tire-derived aggregate, rubberized asphalt concrete, and organic materials.

AB 939 requires that each county in the state of California prepare a countywide Integrated Waste Management Plan (CIWMP). The CIWMP is a countywide planning document that describes the programs to be implemented in unincorporated and incorporated areas of the county that will effectively manage solid waste, and promote and implement the hierarchy of CalRecycle. The CIWMPs consists of a Summary Plan, a SRRE, a Household Hazardous Waste Element, a Non-Disposal Facility Element, and a Countywide Siting Element.

3.8.1.1.3 Local

A Summary Plan is a solid waste planning document required by Public Resources Code §41751, in which counties or regional agencies provide an overview of significant waste management problems faced by the jurisdiction, along with specific steps to be taken, independently and in concert with cities within their boundaries (SCAG, 2012).

The SRRE consists of the following components: waste characterization, source reduction, recycling, composting, solid waste facility capacity, education and public information, funding, special waste and integration. Each city and county is required to prepare, adopt, and submit to CalRecycle an SRRE, which includes a program for management of solid waste generated within the respective local jurisdiction. The SRREs must include an implementation schedule for the proposed implementation of source reduction, recycling, and composting programs. In addition, the plan identifies the amount of landfill and transformation capacity that will be needed for solid waste which cannot be reduced, recycled, or composted (SCAG, 2012).

Each city and county is required to prepare, adopt and submit to CalRecycle a Household Hazardous Waste Element which identifies a program for the safe collection, recycling, treatment, and disposal of hazardous wastes that are generated by households. The Household Hazardous Waste Element specifies how household hazardous wastes generated within the jurisdiction must be collected, treated, and disposed. An adequate Household Hazardous Waste Element contains the following components: Evaluation of alternatives, program selection, funding, implementation schedule and education and public information (SCAG, 2012).

Each city and county is required to prepare, adopt and submit to CalRecycle, a Non-Disposal Facility Element which includes a description of new facilities and expansion of existing facilities, and all solid waste facility expansions (except disposal and transformation facilities) that recover for reuse at least five percent of the total volume. The Non-Disposal Facility Elements are to be consistent with the implementation of a local jurisdiction's

SRRE. Each jurisdiction must also describe transfer stations located within and outside of the jurisdiction, which recover less than five percent of the material received (SCAG, 2012).

Counties are required to prepare a Countywide Siting Element that describes areas that may be used for developing new disposal facilities. The element also provides an estimate of the total permitted disposal capacity needed for a 15-year period if counties determine that their existing disposal capacity will be exhausted within 15 years or if additional capacity is desired (PRC Sections 41700-41721.5) (SCAG, 2012).

Each county in the SCAG region has created a CIWMP in accordance with AB 939. Below is a brief description of the recent updates to these plans by county.

Los Angeles County

Los Angeles County is revising its Summary Plan and Siting Element to reflect changes in the county's policies and goals, including promotion of conversion technologies, formation of the Los Angeles Regional Agency, update of countywide jurisdiction assistance programs to meet diversion goals, expansion of existing disposal facilities, and development of additional non-disposal facilities for the use of out-of-county disposal facilities (SCAG, 2012).

The county's 2009 Annual Report details the revision process, assesses remaining permitted capacity for the mandated 15-year planning horizon, and outlines seven disposal capacity scenarios, two of which project sufficient capacity to meet future demand through the use of conversion technologies and out-of-county disposal facilities. The Annual Report outlines county solid waste management challenges, including a projected shortfall of permitted disposal capacity in the county, insufficient markets for recovered materials, and steps to promote and develop conversion technologies (SCAG, 2012).

Orange County

Orange County completed the first review of its CIWMP in April 2003. It found sufficient disposal capacity for the 15-year planning horizon, but identified other challenges, including the lack of an operational materials recovery facility in the southern portion of the county, changes in records management to comply with the Disposal Recovery System, and determination of accurate base year data (SCAG, 2012).

In addition to the CIWMP, Orange County's Integrated Waste Management Department has initiated a long-term strategic planning project, the Regional Landfill Options for Orange County, which assesses the solid waste disposal needs of Orange County for the next 40 years. The 2007 Strategic Plan Update for this planning project summarizes progress to maximize capacity at existing landfills, assess alternative technologies and potential out-of-county disposal sites, and expand the Frank R. Bowerman and Olinda Alpha landfills (SCAG, 2012).

Riverside County

Riverside County's CIWMP was approved in 1996, and its 2010 Annual Report found the original plan remained applicable, so no comprehensive update is planned. The Non-Disposal Facility Elements was updated in 2009 and includes plans for four possible solid waste material recovery and transfer facilities; two of which would include household hazardous waste disposal facilities. The Non-Disposal Facility Elements also includes an additional proposed solid waste material recovery facility with capacity for household hazardous waste disposal and one composting facility. The 2008 Five Year Review Report for the CIWMP concluded that the most effective allocation of available resources is to continue to utilize the existing CIWMP as a planning tool augmented by annual reports, and that a revision of the CIWMP is not warranted (SCAG, 2012).

San Bernardino County

San Bernardino County's CIWMP five-year review report was completed in 2007. The report reflects updates to the county's goals and policies, changes to its disposal facilities, and assesses disposal capacity for the mandated 15-year planning horizon. Updated policies include programs to help jurisdictions reach diversion goals, such as additional recycling and composting programs and the development of regional material recovery facilities. The 2007 review found that based on the remaining permitted refuse capacity and projected refuse generation for disposal, the landfills within the county have approximately 26 years of capacity (SCAG, 2012).

Regional Water Quality Control Boards (RWQCB)

New or expanded landfills must submit Reports of Waste Discharge to RWQCBs prior to landfill operations. In conjunction with CalRecycle's approval of SWFPs, RWQCBs issue Waste Discharge Orders which regulate the liner, leachate control and removal, and groundwater monitoring systems at Class III landfills (SCAG, 2012).

South Coast Air Quality Management District (SCAQMD)

The SCAQMD regulates emissions from landfills. Landfill owners/operators must obtain permits to construct and operate landfill flares, cogeneration facilities or other facilities used to combust landfill gas. Owner/operators also are subject to the provisions of SCAQMD Rule 1150.1 - Control of Gaseous Emissions from Landfills. This rule requires the submittal of a compliance plan for implementation of a landfill gas control system, periodic ambient monitoring of surface emissions and the installation of probes to detect the lateral migration of landfill gas (SCAG, 2012).

3.8.1.2 Hazardous Waste

3.8.1.2.1 Federal

Hazardous material, as defined in 40 CFR 261.20 and 22 CCR Article 9, is disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills. The

California Health and Safety Code requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a ground water monitoring system.

The HMTA is the federal legislation regulating the trucks that transport hazardous wastes. The primary regulatory authorities are the U.S. DOT, the FHWA, and the Federal Railroad Administration (FRA). The HMTA requires that carriers report accidental releases of hazardous materials to the Department of Transportation at the earliest practicable moment (49 CFR Part 171, Subpart~~chapter~~ C).

RCRA gives the U.S. EPA the authority to control hazardous waste from the "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste by "large-quantity generators" (1,000 kilograms/month or more). Under RCRA regulations, hazardous wastes must be tracked from the time of generation to the point of disposal. At a minimum, each generator of hazardous waste must register and obtain a hazardous waste activity identification number. If hazardous wastes are stored for more than 90 days or treated or disposed at a facility, any treatment, storage, or disposal unit must be permitted under RCRA. Additionally, all hazardous waste transporters are required to be permitted and must have an identification number. RCRA allows individual states to develop their own program for the regulation of hazardous waste as long as it is at least as stringent as RCRA. In California, the U.S. EPA has delegated RCRA enforcement to the State of California.

3.8.1.2.2 State

Authority for the statewide administration and enforcement of RCRA rests with CalEPA's DTSC. While the DTSC has primary responsibility in the state for regulating the generation, transfer, storage and disposal of hazardous materials, DTSC may further delegate enforcement authority to local jurisdictions. In addition, the DTSC is responsible and/or provides oversight for contamination cleanup, and administers state-wide hazardous waste reduction programs. DTSC operates programs to accomplish the following: 1) deal with the aftermath of improper hazardous waste management by overseeing site cleanups; 2) prevent releases of hazardous waste by ensuring that those who generate, handle, transport, store, and dispose of wastes do so properly; and, 3) evaluate soil, water, and air samples taken at sites. The DTSC conducts annual inspections of hazardous waste facilities. Other inspections can occur on an as-needed basis.

Caltrans sets standards for trucks transporting hazardous wastes in California. The regulations are enforced by the CHP. Trucks transporting hazardous wastes are required to maintain a hazardous waste manifest. The manifest is required to describe the contents of the material within the truck so that wastes can readily be identified in the event of a spill.

The storage of hazardous materials in USTs is regulated by CalEPA's State Water Resources Control Board (SWRCB), which has delegated authority to the RWQCB and, typically at the local level, to the local fire department.

The Hazardous Waste Control Act (HWCA) created the State hazardous waste management program, which is similar to but more stringent than the federal RCRA program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste: identification and classification; generation and transportation; design and permitting of recycling, treatment, storage, and disposal facilities; treatment standards; operation of facilities and staff training; and closure of facilities and liability requirements. These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the HWCA and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with DTSC.

The Unified Program required the administrative consolidation of six hazardous materials and waste programs (Program Elements) under one agency, a CUPA. The Program Elements consolidated under the Unified Program are: Hazardous Waste Generator and On-site Hazardous Waste Treatment Programs (also known as Tiered Permitting); Aboveground Petroleum Storage Tank SPCC; Hazardous Materials Release Response Plans and Inventory Program (also known as the Hazardous Materials Accidental Release Plan); UST Program; and Uniform Fire Code Plans and Inventory Requirements. The Unified Program is intended to provide relief to businesses complying with the overlapping and sometimes conflicting requirements of formerly independently managed programs. The Unified Program is implemented at the local government level by CUPAs. Most CUPAs have been established as a function of a local environmental health or fire department. Some CUPAs have contractual agreements with another local agency, a participating agency, which implements one or more Program Elements in coordination with the CUPA.

The Hazardous Waste Source Reduction and Management Review Act of 1989 requires generators of 12,000 kilograms per year of typical operational hazardous waste to conduct an evaluation of their waste streams every four years and to select and implement viable source reduction alternatives. This Act does not apply to non-typical hazardous waste such as asbestos and polychlorinated biphenyls.

3.8.1.2.3 Local

Fire departments and other agencies in the district have a variety of local laws that regulate reporting, storage and handling of hazardous materials and wastes. There are no hazardous waste disposal sites within the jurisdiction of the district. Hazardous waste generated at area facilities, which is not reused on-site, or recycled offsite, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities are the Chemical Waste Management Inc. (CWMI) Kettleman Hills facility in King’s County, and the Clean Harbors (formerly Safety-Kleen) facility in Buttonwillow (Kern County). Kettleman Hills has an estimated 2.5 million cubic yard capacity. Buttonwillow receives approximately 960 tons of hazardous waste per day and has an approximate remaining capacity of approximately nine million cubic yards.

3.8.2 Solid Waste Management

Permit requirements, capacity, and surrounding land use are three of the dominant factors limiting the operations and life of landfills. Landfills are permitted by the local enforcement agencies with concurrence from CalRecycle. Local agencies establish the maximum amount of solid waste which can be received by a landfill each day and the operational life of a landfill. Landfills are operated by both public and private entities. Landfills in the district are also subject to requirements of the SCAQMD as they pertain to gas collection systems, dust and nuisance impacts.

Landfills throughout the region typically operate between five and seven days per week. Landfill operators weigh arriving and departing deliveries to determine the quantity of solid waste delivered. At landfills that do not have scales, the landfill operator estimates the quantity of solid waste delivered (e.g., using aerial photography). Landfill disposal fees are determined by local agencies based on the quantity and type of waste delivered.

Over the past thirteen years, disposal tonnage has decreased significantly in the SCAG region as the emphasis on recycling to meet the requirements of AB 939 has served to divert tonnage from landfills and conserve landfill capacity. Table 3.8-1 shows data from CalRecycle regarding the number of tons disposed in 2010 (the most recent year for which information is available), for each county within the jurisdiction of the district (SCAG, 2012).

TABLE 3.8-1

Solid Waste Disposed in 2010 by County

COUNTY	TOTAL TONNAGE
Los Angeles	6,516,738
Orange	3,522,125
Riverside	3,089,583[(a)]
San Bernardino	1,236,744[(a)]
Total	**14,365,190**

Source: CalRecycle, 2012

(a) Reflects landfills within the district; other landfills outside of the district have not been included.

In viewing facilities on a county-by-county basis, it is important to note that landfills in one county may import waste generated elsewhere. Currently, Orange County offers capacity to out-of-county waste at a "tipping fee" low enough to attract waste from Los Angeles and San Bernardino Counties. In Riverside County, the El Sobrante Landfill is licensed to accept up to 10,000 tons of waste per day from Riverside, Los Angeles, Orange, San Diego, and San Bernardino counties (SCAG, 2012).

Since the enactment of AB 939 in 1989, local governments have implemented recycling programs on a widespread basis, making efforts to meet the 25 percent and 50 percent diversion mandates of AB 939. Statewide, CalRecycle reports that diversion increased from 10 percent in 1989 to 42 percent in 2000 and to 48 percent in 2002. As of 2008, the counties in the SCAG region had met their disposal target rates for waste diversion (SCAG, 2012).

A total of 32 Class III active landfills and two transformation facilities are located within the district with a total capacity of 116,796 tons per day and 3,240 tons per day[1], respectively (see Tables 3.8-2 and 3.8-3). The status of landfills within each county in the district is described in Tables 3.8-6 through 3.8-9.

TABLE 3.8-2

Number of Class III Landfills Located and Related Landfill Capacity

COUNTY	NUMBER OF LANDFILLS	CAPACITY (TONS PER DAY)
Los Angeles	12	50,613
Orange	3	23,500
Riverside[(a)]	7	24,314
San Bernardino[(a)]	10	18,369
Total	32	116,796

Source: CalRecycle, 2012

(a) Data presented is for the entire county and not limited to the portion of the county within the SCAQMD jurisdiction.

TABLE 3.8-3

Waste Transformation Facilities within the District and Related Capacity

FACILITY	COUNTY	PERMITTED CAPACITY (TONS PER DAY)
Commerce Refuse-to-Energy Facility	Los Angeles	1,000
Southeast Resource Recovery Facility	Los Angeles	2,240
Total		**3,240**

Source: LACDPW, 2011a

3.8.2.1 Los Angeles County

The Los Angeles Countywide Siting Element addresses landfill disposal. The purpose of the Countywide Siting Element is to provide a planning mechanism to address the solid waste disposal capacity needed by the 88 cities in Los Angeles County and the unincorporated communities for each year of the 15-year planning period through a combination of existing facilities, expansion of existing facilities, planned facilities, and other strategies.

[1] This repsresents the sum of the permitted capacities of the Southeast Resource Recovery Facility at 2,240 tons per day and the Commerce Refuse-To-Energy Facility at 1,000 tons per day. http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AK-0083/Detail/; http://www.calrecycle.ca.gov/SWFacilities/Directory/19-AA-0506/Detail,

In 2010, residents and businesses in the county disposed of 8.77 million tons of solid waste at Class III landfills and transformation facilities located in and out of the county (see Tables 3.8-4 and 3.8-5). In addition, the amount of inert waste disposed at permitted inert waste landfills totaled 124,820 tons (LACDPW, 2011).

TABLE 3.8-4

Annual Disposal Tonnage for 2010 (County of Los Angeles)

FACILITY TYPE	VOLUME	UNITS
In-County Class III Landfills	6,313,263	tons per year
Transformation Facilities	539,129	tons per year
Exports to Out-of-County Landfills	1,917,993	tons per year
Subtotal MSW[(a)] Disposed	**8,770,385**	tons per year
Permitted Inert Waste Landfills	124,820	tons per year
Grand Total Disposed	**8,895,205**	tons per year

Source: LACDPW, 2011
(a) MSW = Municipal Solid Waste

TABLE 3.8-5

Average Daily Disposal Rate for 2010 (Based on Six Operating Days)
(County of Los Angeles)

FACILITY TYPE	VOLUME	UNITS
In-County Class III Landfills	20,235	tons per day
Transformation Facilities	1,728	tons per day
Exports to Out-of-County Landfills	6,147	tons per day
Subtotal MSW[(a)] Disposed	**28,110**	tons per day
Permitted Inert Waste Landfills	400	tons per day
Grand Total Disposed	**28,510**	tons per day

Source: LACDPW, 2011
(a) MSW = Municipal Solid Waste

3.8.2.1.1 Waste Generation

Based on each jurisdiction's approved diversion rate by CalRecycle, the 2006 countywide diversion rate is estimated at 58 percent. For the purpose of long-term disposal capacity planning, a conservative diversion rate of 55 percent will be assumed for 2010. Therefore, given 8.77 million tons were disposed, it is estimated that the county generates approximately 19.5 million tons or an average of 62,467 tpd based on six operating days per week. Translating it into per capita generation rate, each person in the county generated 10.86 lbs of solid waste each day (LACDPW, 2011).

The Los Angeles County Department of Public Works (LACDPW) conducted a survey requesting landfill operators in the county to provide updates to their estimated remaining disposal capacity based on permitted disposal levels and years of remaining operation. Based on the results of the survey, the total remaining permitted Class III landfill capacity in the county is estimated at 243 million tons (see Table 3.8-6).

TABLE 3.8-6

Los Angeles County Landfill Status(a)

SOLID WASTE FACILITIES	TOTAL YR 2010 (MILLION TONS)	2010 AVERAGE TONS PER DAY	PROJECTED 2011 AVERAGE TONS PER DAY	PERMITTED TONS/DAY	REMAINING PERMITTED CAPACITY (MILLION TONS)	ESTIMATED YEAR OF CLOSURE b
Landfills:						
Antelope Valley	0.154	492	453	1,800	15.5	2022
Burbank	0.038	121	117	240	2.846	2053
Calabasas	0.253	812	842	3,500	6.031	2025
Chiquita Canyon	1.090	3,493	3,718	6,000	65.673	2019
Lancaster	0.257	825	780	1,700	0.886	2012
Pebbly Beach (Avalon)	0.003	10	10	49	0.058	2020
Puente Hills	1.841	5,901	5,523	13,200	12.516	2013
Scholl Canyon	0.245	786	753	3,400	4.104	2024
Sunshine Canyon	2.448	7,845	7,577	12,100	80.805	2037
Whittier (Savage Canyon)	0.075	240	245	350	3.788	2048
Azusa(c)	0.125	400	379	6,500	50.844	--
Total	**6.529**	**20,925**	**20,397**	**48,839**	**243.051**	**--**
Transformation Facilities:						
Commerce Refuse-to-Energy Facility	0.101	322	326	1,000	467	Not Applicable
Southeast Resource Recovery Facility	0.489	1,566	1,483	2,240	1,602	Not Applicable
Total	**0.59**	**1,888**	**1,809**	**3,240**	**2,069**	

(a) Source: Los Angeles County Integrated Waste Management Plan, Los Angeles County Department of Public Works, 2011.
(b) Source: SCAG, 2012
(c) Currently only accepting inert waste.

Because of community resistance to the extension of operating permits for existing facilities and to the opening of new landfills in the county, and the dwindling capacity of those landfills with operating permit time left, the exact date on which landfill capacity within the county will be exceeded is uncertain. Landfill remaining life based on Solid Waste Facility Permits in the county ranges from one year at one facility, to as many as 44 years at another (LACDPW, 2011).

Several landfills have proposed facility expansions. The City of Palmdale approved the expansion of the Antelope Valley Landfill for an additional 8.96 million tons of capacity and approximately eight years of landfill life. The Chiquita Canyon Landfill was given approval to expand in February 2009. Finally, the Lancaster Landfill is proposing to increase the daily permitted disposal to 3,000 tons per day and extend the 2012 closure date.

The LACDPW has reviewed the county's ability to meet daily disposal demands under different scenarios (e.g., landfill expansions, alternative technologies, waste-by-rail systems, and reduction/recycling). Under some of the scenarios, the county will have a difficult time meeting future disposal demands. In order to ensure disposal capacity to meet the county needs, jurisdictions in Los Angeles County must continue to pursue all of the following strategies: 1) expand existing landfills; 2) study, promote, and develop conversion technologies; 3) expand transfer and processing infrastructure; 4) develop a waste-by-rail system; and, 5) maximize waste reduction and recycling.

3.8.2.2 Orange County

Orange County currently has three active Class III landfills. They include the following: Prima Deshecha, Frank R. Bowerman and Olinda Alpha. The Prima Deshecha Landfill has a permitted capacity of 4,000 tons per day and an expected closure date of 2067. The Frank R. Bowerman Landfill has a maximum capacity of 11,500 tons per day, and an expected closure date of 2053. The Olinda Alpha Landfill has a permitted capacity of 8,000 tons per day. The current permit expiration of the Olinda Alpha Landfill is 2021 (see Table 3.8-7).

TABLE 3.8-7

Orange County Landfill Status

LANDFILL	TOTAL YR 2010	PERMITTED TONS/DAY	REMAINING PERMITTED CAPACITY (CUBIC YARDS)	ESTIMATED YEAR OF CLOSURE
Frank R. Bowerman	1,395,735	11,500	205,000,000	2053
Olinda Alpha	1,728,854	8,000	38,578,383	2021
Prima Deshecha	397,536	4,000	87,384,799	2067
Total	**3,522,125**	**23,500**	**330,963,182**	

Source: CalRecycle, 2012

CalRecycle is responsible for ensuring that the county's waste is disposed of in a way that protects public health, safety and the environment. Long-range strategic planning is necessary to ensure that waste generated by the county is safely disposed of and that the county's future disposal needs are met. The Regional Landfill Options for Orange County (RELOOC) program was created for this reason. RELOOC is a 40-year strategic plan being prepared by the IWMD. The purpose of RELOOC is to evaluate options for solid waste disposal for Orange County citizens. The plan was last updated in September 2007 (RELOOC, 2007)

Orange County cities and unincorporated areas have completed, adopted and implemented a Countywide Integrated Waste Management Plan. Orange County cities and unincorporated areas have residential curbside recycling programs in place.

3.8.2.3 Riverside County

Riverside County has six active sanitary landfills with a total capacity of 23,914 tons per day. Each of these landfills is located within the unincorporated area of the county and is classified as Class III. El Sobrante Landfill is a privately operated landfill open to the public. Assuming no expansion, the six major sites have closure dates projected from as early as 2011 to as late as 2186. The projected date of closure for each landfill is tentative and could be affected by engineering, environmental, and waste flow issues (see Table 3.8-8).

TABLE 3.8-8

Riverside County Landfill Status

LANDFILL	TOTAL TONS YR 2010	PERMITTED TONS/DAY	REMAINING PERMITTED CAPACITY (CUBIC YARDS)	ESTIMATED YEAR OF CLOSURE
Badlands	516,675	4,000	14,730,025	2024
Blythe	16,256	400	4,159,388	2047
Desert Center	34	60	23,246	2011 [a]
El Sobrante	2,025,468	16,054.00	145,530,000	2045
Lamb Canyon	529,743	3,000	18,955,000	2021
Mecca II	0	0	0	Closed
Oasis	1,407	400	149,597	2186
Total	**3,089,583**	**23,914**	**183,547,256**	

Source: CalRecycle, 2012

(a) CalRecycle Solid Waste Information System database lists the Desert Center Landfill as active, but also lists a "ceased operation date" of January 1, 2011, which reflects the estimated closure date on the U.S. EPA permit. SWIS summary of report of inspection on August 2, 2012 states the facility is active.

3.8.2.4 San Bernardino County

The County of San Bernardino Solid Waste Management Division (SWMD) is responsible for the operation and management of the County of San Bernardino's solid waste disposal system which consists of five regional landfills and nine transfer stations.

San Bernardino County has seven public landfills within the district's boundaries with a combined permitted capacity of 18,129 tons per day. Mid-Valley/Fontana Landfill is estimated to reach final capacity by the end of 2033, San Timoteo by 2016, Victorville by 2047, Barstow by 2071, Landers by 2018, California Street by 2042 and Colton Landfill by 2017 (see Table 3.8-9).

TABLE 3.8-9

San Bernardino County Landfill Status

LANDFILL	TOTAL TONS YR 2010	PERMITTED TONS/DAY	REMAINING PERMITTED CAPACITY (CUBIC YARDS)	ESTIMATED YEAR OF CLOSURE
Mid-Valley/Fontana	535,876	7,500	67,520,000	2033
San Timoteo	123,500	1,000	11,360,000	2016
Victorville Sanitary	249,657	3,000	81,510,000	2047
Barstow Sanitary	64,612	1,500	924,401	2071
Landers Sanitary	46,407	1,200	765,098	2018
California Street	79,435	829	6,800,000	2042
Colton Landfill	137,257	3,100	2,700,000	2017
Total	**1,236,744**	**18,129**	**171,579,499**	

Source: CalRecycle, 2012

3.8.3 Hazardous Waste Management

Hazardous material, as defined in 40 CFR 261.20 and 22 CCR Article 9, is disposed of in Class I landfills. California has enacted strict legislation for regulating Class I landfills. The California Health and Safety Code requires Class I landfills to be equipped with liners, a leachate collection and removal system, and a ground water monitoring system.

There are no hazardous waste disposal sites within the jurisdiction of the SCAQMD. Hazardous waste generated at area facilities, which is not reused on-site, or recycled off-site, is disposed of at a licensed in-state hazardous waste disposal facility. Two such facilities are the Chemical Waste Management (CWM) Kettleman Hills facility in King’s County, and the Laidlaw Environmental Services facility in Buttonwillow (Kern County).

The Kettleman Hills landfill is operating close to capacity, with reportedly less than one percent of capacity remaining or about 30,000 to 40,000 cubic yards and has reduced the amount of hazardous waste accepted at the landfill (Fresno Bee, 2012). CWM has applied to DTSC for a modification to its RCRA permit at Kettleman Hills to allow for the expansion of its hazardous waste landfill, Unit B-18, by 14 acres and about five million cubic yards. CWM has also applied to the U.S. EPA to both renew and modify its existing permits to allow for the expansion of the landfill. The expansion would provide another 12-14 years of life. DTSC has put approval of the landfill expansion on hold as additional environmental investigations, studies and monitoring have continued.

Buttonwillow is operated by Laidlaw Environmental Services and receives approximately 900 tons of hazardous waste per day. Buttonwillow has an approximate remaining capacity of approximately 8,890,000 cubic yards. The expectant life of the Buttonwillow Landfill is approximately 40 years[2].

Hazardous waste also can be transported to permitted facilities outside of California. The nearest out-of-state landfills are U.S. Ecology, Inc., located in Beatty, Nevada; Laidlaw Environmental Services located in Lake Point, Utah; Envirosafe Services, in Grandview, Idaho; Chemical Waste Management Inc. in Carlyss, Louisiana, and Waste Control Specialists in Andrews, Texas. Incineration is provided at Laidlaw Environmental Services, Inc., located in Deer Park, Texas.

In 2011, less than 1.25 million tons of hazardous waste were generated in the four counties that comprise the district, and about two million tons of hazardous waste were generated in California (see Table 3.8-10). Those amounts are reduced from the totals in 2005 by approximately 17 and 34 percent respectively. The most common types of hazardous waste generated in the district include waste oil, inorganic solid waste, contaminated soils, organic solids, asbestos-containing waste, and unspecified oil-containing wastes. Because of the population and economic base in southern California, a large portion of hazardous waste is generated within the district. Not all wastes are disposed of in a hazardous waste facility or incinerator. Many of the wastes generated, including waste oil, are recycled within the Basin.

[2] Personal communication, Marianna Buoni, Laidlaw Environmental Services, August 2012.

TABLE 3.8-10

Hazardous Waste Generation in the Basin – 2011
(By County) (tons per year)

WASTE NAME	LOS ANGELES	ORANGE	RIVERSIDE	SAN BERNARDINO	COUNTY TOTAL (BASIN)[A]	STATEWIDE TOTAL
Waste & Mixed Oil	237,722	8,624	2,955	45,182	294,483	525,308
Inorganic Solid Waste	159,070	30,383	1,027	20,372	210,852	284,252
Contaminated Soils	100,570	3,649	--[b]	18,047	122,266	391,089
Organic Solids	60,179	45,970	1,529	5,742	113,420	119,263
Asbestos Waste	36,194	6,275	2,558	3,955	48,982	129,463
Unspecified Oil-Containing Waste	30,216	5,975	1,437	13,048	50,676	81,419
Unspecified Solvent Mixture	20,675	827	281	418	22,201	55,196
Aqueous Solutions w/Organic Residues	19,858	2,003	846	7,014	29,721	57,410
Polychlorinated Biphenyls	18,145	498	210	659	19,782	24,855
Polymeric Resin Waste	--	3,174	--	--	3,174	3,477
Household Waste	--	1,687	293	625	2,605	10,169
Unspecified Aqueous Solution	15,085	1,679	601	2,334	19,699	37,583
Unspecified Organic Liquid Mixture	16,345	984	363	1,741	19,433	20,910
Aqueous Solution with Metals[c]	--	734	691	751	2,176	38,052
Unspecified Sludge Waste	--	--	1,266	--	1,266	16,863
Alkaline Solution (pH >= 12.5) W/O Metals	--	--	688	--	688	7,843
Liquids w/Arsenic >= 500 mg/l[d]	270,813	--	--	--	270,813	135,521
Blank/Unknown	4,662	--	267	1,720	6,649	47,829
Totals	**989,534**	**112,462**	**15,012**	**121,608**	**1,238,886**	**1,986,502**

Source: DTSC, 2011

(a) (--) Not on list of top twenty waste totals generated in the county.

(b) Data presented is for county total and not limited to the portion of the county within SCAQMD jurisdiction.

(c) Smaller than restricted levels.

(d) The data for this waste code is as reported in the California Hazardous Waste Tracking System database; however, one or more of the data entries for this waste category appear to be in error.

SUBCHAPTER 3.9

TRANSPORTATION AND TRAFFIC

Introduction

Transportation Regulatory Framework

Existing Traffic Setting

3.9 TRANSPORTATION AND TRAFFIC

3.9.1 Introduction

Some of the proposed 2012 AQMP control measures intended to improve overall air quality may have direct or indirect traffic impacts associated with their implementation. Traffic concerns are related to modifications to the existing transportation system that may generate significant impacts, primarily during the construction phases. This section describes the current transportation system in southern California.

Comments were received on the NOP/IS for the 2012 AQMP that potentially significant impacts could occur as a result of implementing §182 (e) Control Measure ADV-01 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles. The comment suggested that constructing the overhead electrical catenary lines could adversely affect traffic. Therefore, this potential impact will be evaluated in this Final Program EIR.

3.9.2 Transportation Regulatory Framework

3.9.2.1 Federal Regulatory Framework

The Transportation Equity Act for the 21st Century (TEA-21), signed into law in 1998, provides the regulatory framework at the federal level for transportation planning in urban areas. This legislation requires that Metropolitan Planning Organizations (MPO) prepare long-range transportation plans. In federally designated air quality nonattainment and maintenance areas, the long-range transportation plan is to be updated every three years. The State of California has additional regulations for the preparation of long-range transportation plans. Otherwise, because transportation and traffic are generally local activities, there are no other federal regulations that are pertinent to the proposed project.

3.9.2.2 State Regulatory Framework

California Department of Transportation (Caltrans): Traffic management in the state of California is guided by policies and standards set at the state level, primarily by the California Department of Transportation (Caltrans). Caltrans is an executive department within California responsible for highway, bridge, and rail transportation planning, construction, and maintenance. Its purpose is to improve mobility across the state. Caltrans manages the state highway system (which includes the California Freeway and Expressway System) and is actively involved with public transportation systems throughout the state. For administrative purposes, Caltrans has divided the state of California into 12 districts supervised by district offices. In southern California, District 7 covers Los Angeles and Ventura counties, District 12 covers Orange County, and District 8 covers Riverside and San Bernardino counties.

Caltrans in conjunction with the California Highway Patrol (CHP) has created Transportation Management Centers (TMCs) to rapidly detect and respond to roadway incidents, while managing the resulting traffic congestion. With the help of intelligent transportation system technologies, such as electronic sensors in the pavement, freeway call boxes, video cameras, ramp meter sensors, earthquake monitors, motorist cellular calls, and commercial traffic reports, as well as Caltrans highway crews, 911 calls and officers on patrol, each TMC provides coordinated transportation management for general commutes, special events and incidents affecting traffic. The TMCs are operated within each Caltrans district.

CARB's Truck and Bus Regulation: CARB's Truck and Bus Regulation was adopted in December 2008 to reduce PM and NOx emissions from existing diesel vehicles operating throughout California. The regulation applies to nearly all diesel fueled trucks and buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds that are privately or federally owned and for privately and publicly owned school buses. The regulation requires all trucks and buses to have 2010 model year engines by 2023. As of January 1, 2012, heavier trucks would be required to meet the engine model year phase-in schedule and fleets that comply with the schedule would install the best available PM filter on 1996 model year and newer engines and would replace the vehicle eight years later. Trucks with 1995 model year and older engines would be replaced starting 2015. Replacements with a 2010 model year or newer engines meet the final requirements, but fleets could also replace with used trucks that would have a future compliance date on the schedule. In addition, fleets that report and use the phase-in option for heavier trucks, could take advantage of credits to delay requirements for other heavier trucks in the fleet until 2017 for the following:

- PM filters installed before July 2011;
- Early purchase of cleaner engines before 2012 (originally equipped with PM filters) ;
- Reducing the number of trucks since 2006; and,
- Adding fuel-efficient hybrids or alternative fueled engines to the fleet.

As part of the analysis of the phase-in option, CARB's projections at the time the Truck and Bus Regulation was adopted estimated the number of plug-in hybrid vehicles, battery electric vehicles, and fuel cell vehicles that will be driving on district roadways will substantially increase between year 2013 and year 2025, as shown in Table 3.9-1.

TABLE 3.9-1

CARB's Projected Populations of Near-Zero and Zero Emission Vehicles in the District

YEAR	PLUG-IN HYBRID VEHICLE (PHEV)	BATTERY ELECTRIC VEHICLE (BEV)	FUEL CELL VEHICLE (FCV)	TOTAL
2013	15,088	7,196	771	23,055
2014	22,626	7,476	1,058	31,160
2015	33,217	9,725	2,204	45,146
2016	44,442	12,114	3,420	59,976
2017	55,708	14,496	4,635	74,839
2018	79,608	19,778	5,825	105,211
2019	108,615	30,754	8,398	147,767
2020	142,290	46,129	12,837	201,256
2021	178,827	64,365	19,049	262,241
2022	219,896	84,998	27,745	332,639
2023	265,310	108,206	38,839	412,355
2024	314,923	132,900	52,784	500,607
2025	368,087	157,414	69,896	595,397

Source: Communication with ARB Staff, Mobile Source Division, August 14, 2012.

3.9.2.3 Regional Regulatory Framework – Congestion Management Programs (CMPs)

In order to meet federal certification requirements, county Congestion Management Agencies (CMAs) have worked together to develop a congestion management process for the southern California area. In southern California, the Congestion Management System (CMS) is comprised of the combined activities of the Regional Transportation Plan (RTP), the CMP and the Regional Transportation Improvement Program (RTIP).

Under California law, CMPs are prepared and maintained by the CMAs. The Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority (OCTA), Riverside County Transportation Commission (RCTC), and San Bernardino Associated Governments (SANBAG) are the designated CMAs of each county and are subject to State requirements.

In addition to the SCAG RTP and RTIP, the key elements of the federal Congestion Management Process are addressed through the counties' CMPs. Because the magnitude of congestion and degree of urbanization differ among the counties, each CMP differs in form and local procedure. By state law, all CMPs perform the monitoring and management functions summarized in the following bullet points, which also fulfill the federal CMP requirements:

- Highway Performance: The monitoring of the performance of an identified highway system as conducted by each CMA allows each county to track how their system, and its individual components, is performing against established standards, and how performance changes over time.

- Multi-Modal Performance: Each CMP contains an element to evaluate the performance of other transportation modes including transit.
- Transportation Demand Management: Each CMP contains a Transportation Demand Management (TDM) component geared at reducing travel demand and promoting alternative transportation methods.
- Land Use Programs and Analysis: Each CMP incorporates a program for analyzing the effects of local land use decisions on the regional transportation system.
- Capital Improvement Program: Using data and performance measures developed through the activities identified above, each CMP develops a Capital Improvement Program (CIP) which is the first step in developing the RTIP. Under state law, projects funded through the RTIP must first be contained in the county CIP.
- Deficiency Planning: The CMP contains provisions for "deficiency plans" to address unacceptable levels of congestion. Deficiency plans can be developed for specific problem areas or on a system-wide basis. Projects implemented through the deficiency plans must, by statute, have both mobility and air quality benefits. In many cases, the deficiency plans capture the benefits of transportation improvements that occur outside the county TIPs and RTIP such as non-traditional strategies and/or non-regionally significant projects.
- The regional transportation planning process and the county congestion management process should be compatible with one another. To ensure consistency, SCAG and the CMAs have developed the Regional Consistency and Compatibility Criteria for CMPs. Information on the CMP activities and resulting data are updated on a biennial basis by each CMA and supplied to SCAG and air quality management districts.

3.9.2.4 Local Regulatory Framework – General Plans

Under state planning law, every city and county must adopt a General Plan that sets forth the goals, policies and implementation measures for future growth and development. General plans must include seven elements, among which is a circulation element. The circulation element must describe the existing transportation network and describes all planned future transportation improvements. Many local transportation elements, or their implementing ordinances, include criteria for measuring the functionality of current and future roadways, typically through a level-of-service (LOS) measurement system, a volume-to-capacity (VC) ratio, or other such approaches.

3.9.2.5 Transportation-related Policies in California

3.9.2.5.1 METRANS Transportation Center

The METRANS Transportation Center, a joint partnership between the University of Southern California and California State University Long Beach, is a University Transportation Center that was established in 1998 under the TEA-21 as a policy advocacy organization to foster independent, high quality research to solve the nation's transportation problems. The mission of METRANS is to "solve transportation problems of large metropolitan regions through interdisciplinary research, education and outreach." METRANS conducts research in several areas relating to transportation, including safety, security, and vulnerability. In addition to performing research, one of the primary goals of METRANS is to disseminate the research information, as well as, best practices and technology to the professional community

3.9.2.5.2 Intelligent Transportation System

One way to incorporate safety and security into transportation planning is through greater collaboration between transportation planning and operations. An Intelligent Transportation System (ITS) is one method of establishing this collaborative relationship by creating an ITS Architecture. An ITS Architecture is a framework for ensuring institutional agreement and technical integration of technologies for the implementation of projects or groups of projects under an ITS strategy. ITS projects were originally designed to increase transportation efficiency and to enhance the safety, security and emergency response capabilities of the region.

Because the successful operation of ITS projects usually depend on multiple agencies and the systems they operate, a framework, made up of multiple ITS Architectures, has been developed at the state, regional, and local levels to help achieve cooperation, coordination and communication amongst participants in the most cost-effective manner. For example, at the state level, the California ITS Architecture and System Plan addresses those services that are managed at a state level or are interregional in nature. Project sponsors are responsible for ensuring that their projects maintain consistency with the regional architectures, regardless of which architecture applies, as a requirement for federally funded projects.

At the regional level, a Regional ITS Architecture provides a framework to address multi-county issues including those projects, programs, and services that require connectivity across county boundaries or are deployed at a multi-county level for ITS planning that promotes interoperability and communication across jurisdictional boundaries. Projects developed under a regional framework extend the usefulness of any single project by making information easily accessible for operators and users of the system. For example, the southern California ITS Regional Architecture is a Regional ITS Architecture that was developed specifically for all counties in the southern California area in order to document the ITS Architecture covering the region.

Local components to the ITS Architecture exist for Los Angeles County, Orange County, Riverside County, and San Bernardino County.

3.9.3 Existing Traffic Setting

The southern California transportation system is a complex intermodal network that consists of roads, highways, public transit, paratransit, bus, rail, airports, seaports and intermodal terminals designed to carry both people and goods. The regional highway system consists of an interconnected network of local streets, arterial streets, freeways, carpool lanes and toll roads. This highway network allows for the operation of private automobiles, carpools, private and public buses, and trucks. Active transportation modes, such as bicycles and pedestrians share many of these facilities. The regional public transit system includes local shuttles, municipal and area-wide public bus operations, rail transit operations, regional commuter rail services, and interregional passenger rail service. The freight railroad network includes an extensive system of private railroads and several publicly owned freight rail lines serving industrial cargo and goods. The airport system consists of commercial, general, and military aviation facilities serving passenger, freight, business, recreational, and defense needs. The region's seaports support substantial international and interregional freight movement and tourist travel. Intermodal terminals consisting of freight processing facilities, which transfer, store, and distribute goods. The transportation system supports the region's economic needs, as well as the demand for personal travel.

Transit use is growing in southern California. As of 2009, transit agencies in the southern California area reported 747.3 million boardings (SCAG, 2012). This represents growth of nearly 20 percent in the ten years between 2000 and 2010, but only four percent growth in per capita trips due to population growth. Metrolink and Metro Rail (Los Angeles County) have seen ridership growth of six percent to eight percent per year.

3.9.3.1 Transportation Planning

Numerous agencies are responsible for transportation planning and investment decisions within the southern California area. SCAG helps integrate the transportation-planning activities in the region to ensure a balanced, multimodal plan that meets regional as well as county, subregional, and local goals.

Table 3.9-2 identifies local and state agencies that participate in the development of RTP. Seven major entities and agencies are involved including SCAG as the designated Metropolitan Planning Organization, the County Transportation Commissions, Subregional Councils of Governments, local and county governments, transit and transportation owners, operators and implementing agencies, resource/regulating agencies and other private non-profit organizations, interest groups and tribal nations.

TABLE 3.9-2

Stakeholders in Transportation Planning in the Southern California Area

COUNTY TRANSPORTATION COMMISSIONS
Los Angeles County Metropolitan Transportation Authority (Metro)
Orange County Transportation Authority (OCTA)
Riverside County Transportation Commission (RCTC)
SUBREGIONAL COUNCILS OF GOVERNMENTS
Southern California Association of Governments (SCAG)
San Bernardino Associated Governments (SANBAG)
City of Los Angeles
North Los Angeles County
Orange County Council of Governments
San Fernando Council of Governments
San Gabriel Valley Council of Governments
Western Riverside County Council of Governments
Westside Cities Council of Governments
OTHERS
Caltrans
Airport Authorities
Port Authorities
Transportation Corridor Agencies
Transit/Rail Operators

Each of the four counties within the jurisdiction of the SCAQMD has a Transportation Commission or Authority. These agencies are charged with countywide transportation planning activities, allocation of locally generated transportation revenues, and in some cases operation of transit services. In addition, there are many subregional Councils of Government within the southern California area. A Council of Government is a group of cities and communities geographically clustered (sometimes comprising an entire county, e.g., Orange County), which work together to identify, prioritize, and seek transportation funding for needed investments in their respective service areas.

3.9.3.2 Existing Circulation System

3.9.3.2.1 Commute Patterns and Travel Characteristics

The existing transportation network serving the southern California area supports the movement of people and goods. On a typical weekday in the four-county region, including those portions of the county not located within the jurisdiction of the SCAQMD, the transportation network supports a total of approximately 420 million vehicle miles of travel (VMT) and 12 million vehicle hours of travel (VHT). Of these totals, over half occur in Los Angeles County and less in Orange County, San Bernardino County, and Riverside County, respectively. Detailed summaries of the existing VMT and VHT for the area are presented in Table 3.9-3 and Table 3.9-4, respectively.

TABLE 3.9-3

Summary of Existing Daily Vehicle Miles

County	Vehicle Miles of Travel (VMT)					
	AM Peak Period		PM Peak Period		Daily	
	Miles	% of Region	Miles	% of Region	Miles	% of Region
Los Angeles	46,321,000	54%	74,635,000	54%	224,312,000	54%
Orange	15,589,000	18%	24,793,000	18%	75,224,000	18%
Riverside	12,099,000	14%	18,817,000	14%	60,494,000	14%
San Bernardino	12,242,000	14%	18,944,000	14%	61,010,000	14%
Total	**86,251,000**	**100%**	**137,189,000**	**100%**	**420,980,000**	**100%**

Source: SCAG 2012. Data presented are for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

TABLE 3.9-4

Summary of Existing Daily Vehicle Hours of Travel

County	Vehicle Hours of Travel (VHT)					
	AM Peak Period		PM Peak Period		Daily	
	Hours	% of Region	Hours	% of Region	Hours	% of Region
Los Angeles	1,627,000	60%	3,181,000	62%	7,428,000	60%
Orange	474,000	17%	879,000	17%	2,171,000	17%
Riverside	320,000	12%	542,000	11%	1,469,000	12%
San Bernardino	307,000	11%	512,000	10%	1,416,000	11%
Total	**2,728,000**	**100%**	**5,114,000**	**100%**	**12,484,000**	**100%**

Source: SCAG, 2012. Data presented are for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

Much of the existing travel in the southern California area takes place during periods of congestion, particularly during the morning (6:00 AM to 9:00 AM) and evening peak periods (3:00 PM to 7:00 PM). Congestion can be quantified as the amount of travel that takes place in delay (vehicle hours of delay or VHD), and alternately, as the percentage of all travel time that occurs in delay (defined as the travel time spent on the highway due to congestion, which is the difference between VHT at free-flow speeds and VHT at congested speeds). Table 3.9-5 presents the existing travel delays and percent of regional VHT in delay by County on freeways and arterials. As shown in Table 3.9-5, regional travel time in delay represents approximately 25 percent of all daily, 30 percent of all AM peak period, and 38 percent of all PM peak period travel times.

TABLE 3.9-5

Summary of Existing Vehicle Hours of Delay

County	Vehicle Hours of Delay			% of Travel in Delay		
	AM Peak Period	AM Peak Period	Daily	AM Peak Period	AM Peak Period	Daily
Los Angeles	554,000	1,387,000	2,204,000	34%	44%	4%
Orange	128,000	313,000	493,000	27%	36%	23%
Riverside	78,000	158,000	263,000	24%	29%	18%
San Bernardino	64,000	125,000	205,000	21%	24%	14%
Total	**824,000**	**1,983,000**	**3,165,000**	**30%**	**38%**	**25%**

Source: SCAG, 2012. Data presented are for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

The average vehicle home-to-work trip duration in each county is generally similar while a greater range of average work distances is found in the different counties of the region (from a low of 13 miles in Orange County to a high of 18 miles in San Bernardino and Riverside counties) (Table 3.9-6). Home-to-work trip duration and distance are both greater for the inland counties of Riverside and San Bernardino, reflecting regional housing and employment distribution patterns. A substantial portion of AM peak period travel in each county takes place in delay, ranging from a low of 21 percent in San Bernardino County to a high of 34 percent in Los Angeles County, as indicated in Table 3.9-5.

Based on average accident rates provided by Caltrans, transportation-related fatalities occur at an overall rate of 0.83 fatalities per 100 million vehicle miles traveled, taking into account the varying accident rates on different facility types (freeway, arterials) and travel modes (bus transit, rail transit) (SCAG, 2012). These specific accident rates and the resulting estimate of region-wide accidents are detailed in Table 3.9-7.

TABLE 3.9-6

Summary of Existing Vehicle Work Trip Length

County	Average Home to Work Trip Distance (miles)	Average Home to Work Duration (minutes)	
	Vehicle Trips (AM Only)	Vehicle Trips (AM Only)	Transit Trips (AM Only)
Los Angeles	14	26	69
Orange	13	21	78
Riverside	18	29	95
San Bernardino	18	29	116

Source: SCAG 2012-2035 RTP/SCS Program Draft EIR.
Data presented are for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

TABLE 3.9-7

Total Vehicle Fatalities

County	Fatalities (2009)	Fatalities per 100 Million Vehicle Miles Traveled	Annual Vehicle Miles Traveled per 100 Million
Los Angeles	589	0.76	778
Orange	154	0.59	261
Riverside	219	1.04	210
San Bernardino	236	1.11	212

Source: SCAG 2012-2035 RTP/SCS Program Draft EIR.
Data presented are for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

A summary of home-to-work trip characteristics by county is presented in Table 3.9-8. Single passenger occupancy vehicles is still the most common form of transportation for home to work trips, accounting for 76 percent of the trips in Los Angeles County, 81 percent of the trips in Orange County, and 82 percent of the trips in Riverside and San Bernardino County. Public transit in all forms (including school buses) carries approximately 2.4 percent of all trips in the southern California area. Of these, the greatest number of travelers is carried by buses, with lesser patronage on Metro Rail, paratransit, commuter rail and other forms of public transit services. Work trips made via public transit account for about 6.1 percent of all home-to-work trips in the area.

TABLE 3.9-8

Existing Travel Mode Split (% of County Total)

County	Person Trip Type	Drive Alone	2 Person Carpool	3 Person Carpool	Auto Passenger Trip	Transit	Non-Motorized	Total
Los Angeles	Home-Work/Univ	76%	3.4%	1.5%	7.1%	9.1%	3%	100%
	All Daily Trips	43%	8%	6.5%	24%	3.5%	14%	100%
Orange	Home-Work/Univ	81%	3.7%	1.5%	7.4%	3.4%	3%	100%
	All Daily Trips	46%	8.3%	6.8%	26%	1.4%	12%	100%
Riverside	Home-Work/Univ	82%	3.7%	1.8%	8%	1.5%	3.1%	100%
	All Daily Trips	42%	8.3%	7.3%	27%	0.72%	15%	100%
San Bernardino	Home-Work/Univ	82%	3.8%	1.8%	8.3%	1.4%	3%	100%
	All Daily Trips	43%	8.4%	7.3%	27%	0.58%	14%	100%

Source: SCAG, 2012.
Data presented is for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

3.9.3.2.2 Regional Freeway, Highway and Arterial System

The regional freeway and highway system as shown in Figure 3.9-1 is the primary means of person and freight movement for the region. This system provides for direct automobile, bus and truck access to employment, services and goods. The network of freeways and State highways serves as the backbone of the system offering very high capacity limited-access travel and serving as the primary heavy duty truck route system.

Major freeways that transverse Los Angeles County in a generally north/south direction include the San Diego Freeway (I-405), the Golden State Freeway (I-5), the Hollywood Freeway (I-101), Pasadena Freeway (I-110), the Long Beach Freeway (I-710), and the San Gabriel Freeway I-605). Major freeways that transverse Los Angeles County in a generally east/west direction include the Santa Monica Freeway (I-10), Century Freeway (I-105), Foothill Freeway (I-210), Ronald Reagan Freeway (I-118), Pomona Freeway (I-60), and Riverside Freeway (I-91).

Major freeways that transverse Orange County in a generally north/south direction include I-405, I-5, the Orange Freeway (I-57), and the Newport Freeway (I-55), as well as toll roads located in the south-eastern portion of the County (I-241 and 261). Major freeways that transverse Orange County in a generally east/west direction include the I-91, Garden Grove Freeway (I-22), and Corona Del Mar Freeway (I-73).

Major freeways that transverse Riverside County in a generally north/south direction include the Chino Valley Freeway (I-71), Ontario Freeway (I-15), and Escondido Freeway (I-215). Major freeways that transverse Riverside County in a generally east/west direction include the I-91, I-60, and I-10.

Major freeways that transverse San Bernardino County in a generally north/south direction include the Ontario Freeway (I-15), and I-215. Major freeways that transverse San Bernardino County in a generally east/west direction include the Needles Freeway (I-40) (outside of the air Basin).

The components of the regional highway and freeway system are summarized in Table 3.9-9.

TABLE 3.9-9

Existing Regional Freeway Route Miles and Lane Miles by County

County	Freeway Route Miles	Freeway Lane Miles
Los Angeles	637	4,583
Orange	167	1,294
Riverside	309	1,722
San Bernardino	471	2,512
Total	**1,584**	**10,111**

Source: SCAG, 2012.
Data presented are for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

3.9.3.2.3 Regional High Occupancy Vehicle System and Park & Ride System

The regional high occupancy vehicle (HOV) system consists of exclusive lanes on freeways and arterials, as well as bus ways and exclusive rights-of-way dedicated to the use of HOVs. It includes lanes on freeways, ramps and freeway-to-freeway connectors. The regional HOV system is designed to maximize the person-carrying capacity of the freeway system through the encouragement of shared-ride travel modes. HOV lanes operate at a minimum occupancy threshold of either two or three persons. Many include on-line and off-line park and ride facilities, and several HOV lanes are full "transitways" including on-line and offline stations for buses to board passengers. The current system is described in Table 3.9-10.

TABLE 3.9-10

Existing Regional Freeway ~~Route Miles and Lane~~ HOV Total Lane Miles by County

County	HOV Total Lane Miles
Los Angeles	479
Orange	241
Riverside	83
San Bernardino	105

Source: SCAG, 2012.
Data presented is for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

Park and ride facilities are generally located at the urban fringe along heavily-traveled freeway and transit corridors and support shared-ride trips, either by transit, by carpool or vanpool. Most rail transit stations have park and ride lots nearby. There are currently 168 park and ride lots in the southern California area, including Metrolink station parking lots. These facilities include: 106 in Los Angeles County, 20 park and ride facilities in Orange County, 25 in Riverside County, and 17 in San Bernardino County.

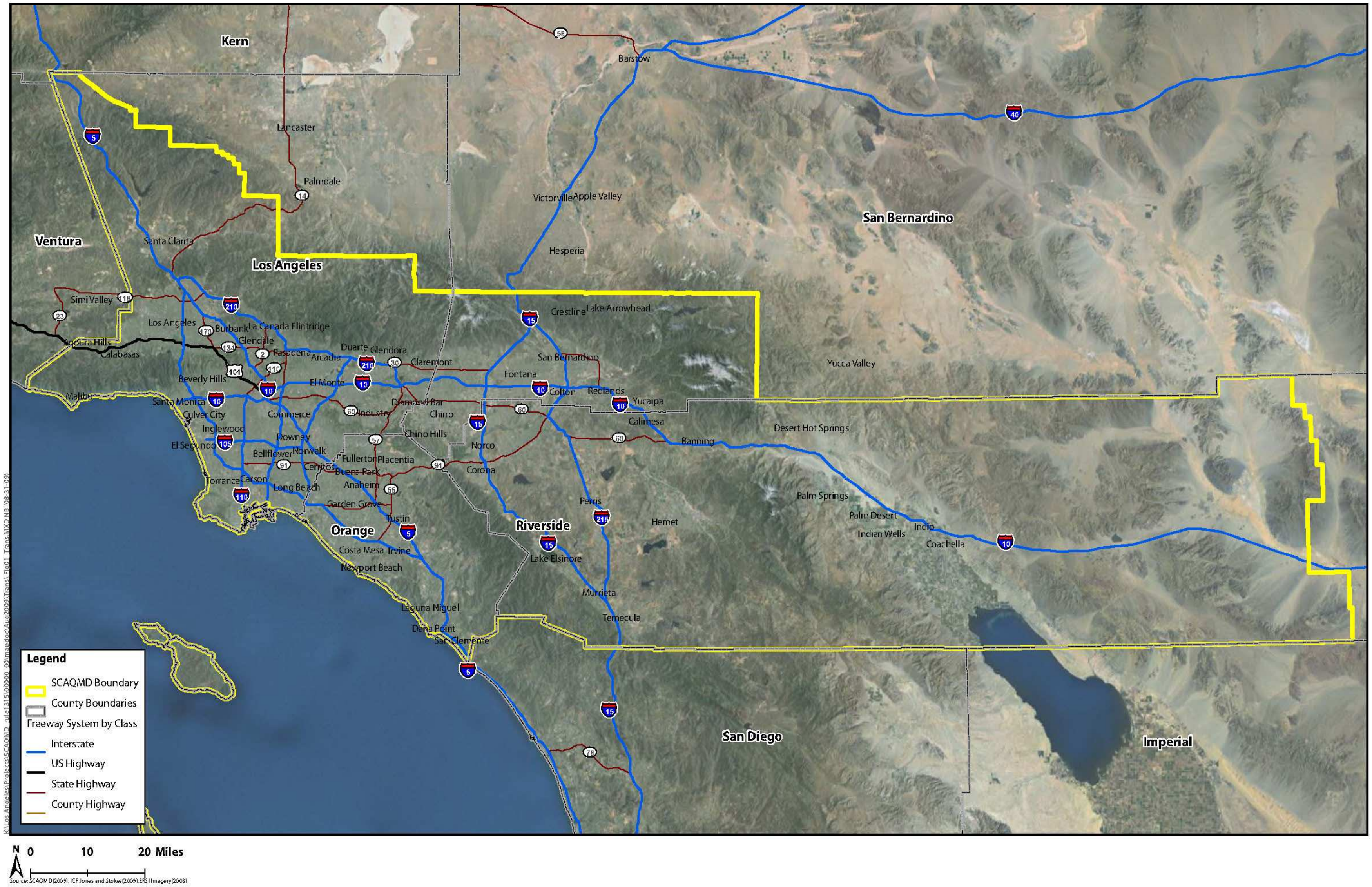


FIGURE 3.9-1

Major Freeway Routes within South Coast Air Quality Management District

3.9.3.2.4 Arterial Street System

The local street system provides access for local businesses and residents. Arterials account for over 80 percent of the total road network and carry a high percentage of total traffic. In many cases arterials serve as alternate parallel routes to congested freeway corridors. Peak period congestion on the arterial street system occurs generally in the vicinity of activity centers, at bottleneck intersections and near many freeway interchanges. The region's arterial street system is described in terms of number of miles in Table 3.9-11.

TABLE 3.9-11

Existing Regional Arterial Route Miles and Lane Miles by County

County	Arterials	Lane Miles
Los Angeles	Principal	8,843
	Minor	9,076
Orange	Principal	3,242
	Minor	3,147
Riverside	Principal	1,181
	Minor	3,235
San Bernardino	Principal	1,934
	Minor	4,365
Total	**Principal**	**15,200**
	Minor	**19,823**

Source: SCAG 2012-2035 RTP/SCS Program Draft EIR.
Data presented are for the entire county and not limited to the portion of the county located within the jurisdiction of the SCAQMD.

3.9.3.3 Goods Movement

Wholesale and retail trade, transportation, and manufacturing support over 3.3 million jobs in the region according to statistics provided by the California Employment Development Department. Goods movement includes trucking, rail freight, air cargo, marine cargo, and both domestic and international freight, the latter entering the country via the seaports, airports, and the international border with Mexico. Additionally, many cargo movements are intermodal (e.g., sea to truck, sea to rail, air to truck, or truck to rail). The goods movement system includes not only highways, railroads, sea lanes, and airways, but also intermodal terminals, truck terminals, railyards, warehousing, freight consolidation/de-consolidation terminals, freight forwarding, package express, customs inspection stations, truck stops, and truck queuing areas.

3.9.3.3.1 Railroads

The southern California area is served by two main line commercial freight railroads (e.g., the Burlington Northern/Santa Fe Railway Co. (BNSF) and the Union Pacific (UP) Railroad). These railroads link southern California with other United States regions, Mexico and Canada either directly or via their connections with other railroads. They also provide freight rail service within California. In 2011, railroads moved approximately 150 million tons of cargo throughout California (SCAG, 2012). These railroads perform specific local functions and serve as feeder lines to the trunk line railroads for moving goods to and from southern California.

The two main line railroads also maintain and serve major facilities in the southern California area. Intermodal facilities in Commerce (BNSF-Hobart), East Los Angeles (UP), San Bernardino (BNSF), and Carson near the San Pedro Bay Ports (UP-ICTF), the Los Angeles Transportation Center (UP-LATC), and the UP-City of Industry yards serve on-dock rail capacity at the Port of Los Angeles (UP/BNSF) and Port of Long Beach (UP/BNSF).

BNSF and UP are both seeking approvals for new or expanded intermodal container facilities to help manage the estimated increase in container movements through the ports. BNSF is seeking approvals for the Southern California International Gateway facility, a new intermodal facility in the City of Los Angeles about four miles north of the Ports of Long Beach and Los Angeles and adjacent to the Alameda Corridor (LAHD, 2011). UP is seeking approvals to expand its existing Intermodal Container Transfer Facility near the City of Carson, adjacent to the Alameda Corridor (ICTF JPA, 2009)

All of the major rail freight corridors in the region have some degree of grade separation, but most still have a substantial number of at-grade crossings on major streets with high volumes of vehicular traffic. These crossings cause both safety and reliability problems for the railroads and for those in motor vehicles at the affected crossings. Trespassing on railroad rights-of-way by pedestrians is another safety issue affecting both freight and commuter railroads. As an example, the Colton Crossing, is an at-grade railroad crossing located south of I-10 between Rancho Avenue and Mount Vernon Avenue in the City of Colton, where BNSF's San Bernardino Line crosses UP's Alhambra/Yuma Lines. In 2008, the Colton Crossing saw on average 110 freight trains per day.

The southern California area is also served by two short line or switching railroads:

- The Pacific Harbor Line (formerly the Harbor Belt Railroad) handles all rail coordination involving the Port of Los Angeles and Port of Long Beach, including dispatching and local switching in the harbor area.
- Los Angeles Junction Railway Company, owned by BNSF, provides switching service in the Vernon area for both the BNSF and UP.

Another key component of the regional rail network is the Alameda Corridor, a 20-mile, four-lane freight rail expressway that began operations in April 2002. In 2010, approximately 14,177 intermodal trains transited the Alameda Corridor, an approximate increase of 8.6 percent since 2009 (SCAG, 2012).

3.9.3.3.2 Marine Ports

Southern California is served by three major deep-water seaports (e.g., Port of Los Angeles, Port of Long Beach, and Port of Hueneme). However, the Port of Hueneme is not within the jurisdiction of the SCAQMD. The Port of Los Angeles and Port of Long Beach handle trade from Asia and North America, and are served by the two major railroads (e.g., BNSF and UP), as well as numerous trucking companies in southern California. The Port of Hueneme handles primarily automobile and agricultural products. Both the Port of Los Angeles and the Port of Long Beach are full service ports with facilities for containers, autos and various bulk cargoes. With an extensive landside transportation network, these three ports moved more than 310 million metric tons of cargo in 2010 (SCAG, 2012).

The Port of Los Angeles and Port of Long Beach dominate the container trade in the Americas by shipping and receiving more than 11.8 million twenty-foot Equivalent Units (TEUs) of containers in 2009. Together, these two ports rank third in the world, behind Rotterdam and Hong Kong, as the busiest maritime ports (SCAG, 2012).

3.9.3.4 Public Transit, Bicycle or Pedestrian Facilities

3.9.3.4.1 Public Transit

In southern California public transit service is comprised of local and express buses, transit ways, Rapid Bus, and urban rail, including subway and light rail, principally centered in the core of Los Angeles County. Transit service is provided by approximately 67 separate public agencies. Twelve of these agencies provide 91 percent of the existing public bus transit service. Local service is supplemented by municipal lines and shuttle services. Private bus companies provide additional regional service.

Transit ridership was approximately 708 million in 2010 in southern California (SCAG, 2012). The largest provider of public transit service in Los Angeles County is the Metro, which provides bus service and an urban light rail system and subway. In 2010, the Metro system experienced approximately 41.9 million average monthly boardings (SCAG, 2010).

The largest provider of public transit service in Orange County is OCTA, which operates 77 bus local and express routes and approximately 62,000 bus stops located throughout the urbanized portions of Orange County. In 2010, the OCTA system experienced approximately 4.8 million average monthly boardings (SCAG, 2010).

The largest provider of public transit service in Riverside County is the Riverside Transit Agency, which operates 231 buses on approximately 43 local and express routes. In 2010, the system experienced approximately 950,000 average monthly boardings (SCAG, 2010).

The largest provider of public transit service in San Bernardino County is Omnitrans, which operates 277 buses over approximately 27 routes. In 2010, the system experienced approximately 1.3 million average monthly boardings (SCAG, 2010).

3.9.3.4.2 Metro Rail System

Existing urban rail lines are located in Los Angeles County and operated by Metro. They include the Metro Blue Line (from Long Beach to downtown Los Angeles), the Metro Green Line (from Redondo Beach to Norwalk), the Metro Red Line subway (from Union Station to North Hollywood), Metro Purple Line (from Union Station to Western Avenue), the Metro Gold Line (from east Los Angeles to Pasadena), and the Metro Expo Line (from Union

Station to Culver City. The Metro Rail system has a total of 87 route miles that serve a total of 80 stations. Ridership on the system is about 303,000 boardings per day (SCAG, 2012)

3.9.3.4.3 Regional Commuter Rail

Metrolink is a commuter rail service that is governed and operated by the Southern California Regional Rail Authority (SCRRA), a joint powers authority that consists of five county agencies tasked with reducing highway congestion and improving mobility throughout southern California: Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority, Riverside County Transportation Commission, San Bernardino Associated Governments and Ventura County Transportation Commission. Metrolink serves as the link between six Southern California counties by providing commuters seamless transportation connectivity options. Metrolink currently operates seven routes including five from downtown Los Angeles to Ventura, Lancaster, San Bernardino, Riverside and Oceanside; one from San Bernardino to Oceanside; and one from Riverside via Fullerton or City of Industry to downtown Los Angeles. The system operates about 144 trains on weekdays, 40 trains on Saturdays, and 26 trains on Sundays to 55 stations on 512 miles of track. Average weekday ridership is approximately 40,544 passengers (SCAG, 2012).

Amtrak provides regional and inter-regional service from San Diego to San Luis Obispo along the Pacific Surfliner corridor. Amtrak also operates four interstate routes within the region that on average have one daily trip.

3.9.3.4.4 Bicycle and Pedestrian Facilities

Biking and walking tend to play a bigger role in densely-populated, mixed land use areas of the region. However, in 2009, less than four percent of commuters within the SCAG region, of which the district is a subset, traveled to work via biking or walking (0.7 percent bicycled and 2.5 percent walked)[1]. Current transit infrastructures provide 97 percent of residents in the SCAG region with access to transit via bicycle and 86 percent access to transit by walking.

The region's bikeways include Class I bikeways, which are shared-use paths that are also used by pedestrians. Class II bikeways are striped lanes in streets, and Class III bikeways are signed routes. Nearly 4,615 miles of Class I and II bikeways exist throughout the region, as well as mountain bike trails. The City of Los Angeles alone has more than 216 miles of Class I and II bikeways. In addition, local jurisdictions in the region have proposed an additional 4,980 miles of bikeways (SCAG, 2012).

Pedestrian access at and near public transit, in most major commercial areas, and many residential areas is facilitated by sidewalks, a number of pedestrian malls, and in some cases local jogging and pedestrian trails or paths.

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[1] SCAG. 2012. 2012 – 2035 Regional Transportation Plan/Sustainable Communities Strategy, adopted April 2012, p. 53. http://rtpscs.scag.ca.gov/Documents/2012/final/f2012RTPSCS.pdf

CHAPTER 4.0

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Introduction

4.0 INTRODUCTION

The CEQA Guidelines require EIRs to identify significant environmental effects that may result from a proposed project [CEQA Guidelines §15126.2 (a)]. Direct and indirect significant effects of a project on the environment should be identified and described, with consideration given to both short- and long-term impacts. The discussion of environmental impacts may include, but is not limited to, the resources involved; physical changes; alterations of ecological systems; health and safety impacts caused by physical changes; and other aspects of the resource base, including water quality, public services, etc. If significant adverse environmental impacts are identified, the CEQA Guidelines require a discussion of measures that could either avoid or substantially reduce any adverse environmental impacts to the greatest extent feasible (CEQA Guidelines §15126.4).

The CEQA Guidelines indicate that the degree of specificity required in a CEQA document depends on the type of project being proposed (CEQA Guidelines §15146). The detail of the environmental analysis for certain types of projects cannot be as great as for others. For example, the EIR for projects, such as the adoption or amendment of a comprehensive zoning ordinance or a local general plan, should focus on the secondary effects that can be expected to follow from the adoption or amendment, but the analysis need not be as detailed as the analysis of the specific construction projects that might follow. As a result, this Program EIR analyzes impacts on a regional level, impacts on the subregional level, and impacts on the level of individual projects or individual facilities only where feasible.

Chapter 4 analyzes the potential environmental impacts of the 2012 AQMP. The primary purpose of the 2012 AQMP is for the SCAQMD~~District~~ to demonstrate compliance with the federal 24-hour PM2.5 standard. As shown in Table 2-3, the 2012 AQMP includes the following short-term PM2.5 Control Measures emissions: CMB-01, BCM-01, BCM-02, BCM-03, BCM-04, IND-01, EDU-01, and MCS-01. The 2012 AQMP also provides an update to the Basin's projections in making expeditious progress in attaining the federal 1-hour and 8-hour ozone standards. As shown in Table 2-3, the following control measures (referred to as CAA Section 182 (e)(5) implementation measures) are proposed to demonstrate expeditious progress in attaining ozone standards: CTS-01, CTS-02, CTS-03, CTS-04, CMB-02, CMB-03, FUG-01, FUG-02, FUG-03, MSC-01, MCS-02, MCS-03, INC-01, INC-02, EDU-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, OFFRD-05, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07.

This chapter is subdivided into the following sections based on the area of potential impacts: aesthetics, air quality, energy, hazards, hydrology and water quality, land use, noise, traffic and transportation, and solid and hazardous waste. Included for each impact category is a discussion of project-specific impacts, project-specific mitigation (if necessary and available), remaining impacts, and a summary of impacts for each resource. Also, included within each resource evaluation is a summary of impacts that would be expected for the short-term PM2.5 Control Measures and a summary of impacts for the ozone Control Measures.

In order to address the full range of potential environmental impacts several assumptions were made for purposes of evaluation. First, to provide a "worst-case" analysis, the environmental analysis contained herein assumes that the control measures contained in the AQMP apply to the entire district (e.g., the Basin and those portions of the MDAB and SSAB under the SCAQMD's jurisdiction). If control equipment which has secondary adverse environmental impacts could be used to comply with a particular control measure, it was assumed that such equipment would be used even if it may not be the most appropriate technology or method of compliance. For example, the analysis assumes that all vehicles in ONRD-01 were assumed to be electrified in the analysis of energy impacts. However, they were also included in the analysis of alternative fuels, as alternative fuels (e.g., natural gas) could also be used to implement ONRD-01. This approach was taken for each environmental topic. In practice, there are typically a number of ways to comply with requirements of SCAQMD rules, but only one type of compliance option will actually be implemented. This approach has the potential to substantially overestimate impacts because only a single type of control equipment will be used.

Every control measure in the 2012 AQMP was evaluated to determine whether or not it has the potential to generate adverse environmental impacts. Each environmental topic subchapter in Chapter 4 contains a table identifying those control measures that have the potential to generate significant adverse impacts to that environmental topic. Table 4.0-1 lists the various control measures, which were evaluated and determined not to have significant adverse impacts on the environment and, therefore, were not evaluated further.

TABLE 4.0-1

Control Measures With No Expected Impacts

Control Measures	Control Measure Title (Pollutant)	Control Methodology	Reason Not Significant
BCM-01	Further Reductions from Residential Wood Burning Devices	The current mandatory wood burning curtailment threshold would be lowered, resulting in increased days when wood burning would be prohibited.	Increase in no burn days, no physical modifications.
BCM-02	Further Reductions from Open Burning	Prohibit open burning whenever PM2.5 concentrations are expected to exceed specific concentrations.	Increase in no burn days, no physical modifications.
FUG-03	Further VOC Reductions from Fugitive VOC Emissions	Require at least a self-inspection program and/or optical gas imaging-assisted leak detection and repair program and explore the use of new technologies to detect and verify VOC fugitive emissions.	Increased Inspection and monitoring.
EDU-01	Further Criteria Pollutant Reductions from Education, Outreach and Incentives	Voluntary program that provides outreach to consumers, business owners and residences on clean air practices.	Education

There are several reasons why the control measures in Table 4.0-1 are not expected to generate significant adverse impacts. First, the primary control methods of compliance do not involve control equipment that would generate any adverse secondary or cross media impacts. For example, BCM-01 and BCM-02 would limit wood burning and open burning activities during days when PM2.5 concentrations exceed specific thresholds. Since the burning would likely be shifted to other days, no physical impacts are expected to occur. FUG-03 would largely control VOC emissions through enhanced inspection and maintenance practices to reduce fugitive emissions from material transfer, storage, and processing. Inspection and maintenance practices are not expected to generate secondary impacts because these are procedures to ensure proper operation of equipment. Finally, EDU-01 involves outreach and education so that consumers can make informed choices in purchases, conducting efficiency upgrades, installing clean energy sources, and approaches to energy conservation. EDU-01 is a voluntary measure that would educate the public in general. Any impacts are expected to be positive in terms of changing behavior, but are not expected to result in physical, adverse impacts.

In addition, one control measures proposed in the 2012 AQMP for which there is insufficient information regarding compliance options or how they would be implemented to determine the potential impacts (see Table 4.0-2). OFFRD-05 would impose fees but does not indicate how the fees would be used. The fees could be used for educational purposes or purchasing control equipment. Because the control measure is general in nature, it is difficult to determine what, if any, impacts could be expected from this control measure. Therefore, the impacts of OFFRD-05 would be considered speculative and no further environmental analysis is required (CEQA Guidelines §15145).

TABLE 4.0-2

Control Measures Whose Impacts Are Speculative

Control Measures	Control Measure Title (Pollutant)	Control Methodology	Reason Not Significant
OFFRD-05	Emission Reductions from Ocean-Going Marine Vessels	Would enhance Ports' existing financial incentive programs for early deployment of Tier 3 vessels calling at the Ports.	Economic Incentives

SUBCHAPTER 4.1

AESTHETICS

Introduction

2012 AQMP Control Measures with Potential Aesthetics Impacts

Significance Criteria

Potential Aesthetics Impacts and Mitigation Measures

Project-Specific Mitigation Measures

Summary of Aesthetics Impacts

4.1 AESTHETICS

4.1.1 Introduction

This subchapter examines impacts of the proposed control measures in the 2012 AQMP on aesthetic resources. All control measures in the 2012 AQMP were evaluated to determine whether or not they could generate aesthetic impacts based on the anticipated methods of control. Three control measures were determined to result in potential aesthetic impacts.

4.1.2 2012 AQMP Control Measures with Potential Aesthetics Impacts

The aesthetic impact analysis in this Final Program EIR identifies the net effect on aesthetic resources from implementing the 2012 AQMP. Implementing some of the 2012 AQMP control measures could potentially result in aesthetic impacts. Specifically, several control measures promote the use of zero and near-zero emission trucks and locomotives powered by electricity. In addition to electricity stored in batteries or produced onboard through a fuel cell, these control measures contemplate the use of "wayside" electricity from outside sources such as overhead catenary power lines, as currently used for transit buses, which could impact scenic highways and vistas.

Evaluation of control methods for each control measure indicated that there are three ozone control measures that could have potential aesthetic impacts, as shown below in Table 4.1-1.

TABLE 4.1-1

Control Measures with Potential Aesthetics Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	AESTHETIC IMPACT
OZONE CONTROL MEASURES			
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards	Accelerated use of hybrid electric or fuel cells	Potential increase in amount of overhead power lines.
ADV-01	Actions for the Deployment of Zero and Near-Zero Emission On-Road Heavy-Duty Vehicles	Development and use of "wayside" electric or magnetic infrastructure.	Potential impacts from construction of "wayside" electric or magnetic infrastructure.
ADV-02	Actions for the Deployment of Zero and Near-Zero Emission Locomotives	Development and use of "wayside" electric or magnetic infrastructure.	Potential impacts from construction of "wayside" electric or magnetic infrastructure.

4.1.3 Significance Criteria

Implementation of the 2012 AQMP will be considered to have significant adverse aesthetic impacts if any of the following conditions occur:

- Substantially adversely affect a scenic vista;

- Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of a site and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

4.1.4 Potential Aesthetics Impacts and Mitigation Measures

PROJECT SPECIFIC IMPACTS: Control measures ONRD-05, ADV-01 and ADV-02 included in the 2012 AQMP relate primarily to emission reductions through the incorporation of electrically powered trucks and locomotives. To power this equipment, catenary lines (overhead power lines) could be constructed and could potentially result in aesthetic impacts. These lines are similar to "trolley car lines" associated with electrically powered trollies and buses common in metropolitan transportation.

The areas affected by the proposed zero and near-zero emission control measures that could result in the installation of catenary lines are expected to be located in commercial areas, industrial areas, along existing transportation corridors in areas within and adjacent to the Port of Los Angeles (e.g., Navy Way, and Port of Long Beach), around container transfer facilities (truck/train) near the Terminal Island Freeway and East Sepulveda Boulevard intersection, along the Alameda Corridor, as well as the railyards near downtown Los Angeles (East Washington Boulevard in the City of Commerce, which are located within three miles of the northern terminus of the Alameda Corridor and east of I-710). It is not expected that residential areas will be impacted by the installation of catenary lines.

<u>Construction Activities</u>: Construction activities may result in a temporary effect on businesses and residents along transportation corridors. Construction activities in these areas would be conducted with typical roadway construction equipment (bulldozers, graders, backhoes, cranes, etc.), which are not generally considered high profile, thus affecting views or visibility. Potential impacts would be temporary and would cease after completion of construction.

As shown in Table 3.1-2, the nearest officially designated Scenic Highway to either the Ports, the cargo transfer facilities serving the ports, along the Alameda Corridor, or the cargo transfer facilities in the City of Commerce, would be Route 2 (Angeles Crest Scenic Byway) near La Canada/Flintridge, in the northeastern portion of Los Angeles County. It is approximately 14 miles from the northern terminus of the Alameda Corridor and the cargo transfer railyards in the City of Commerce to the most southern portion of Route 2. The port area, Alameda Corridor or downtown railyards are not visible from Route 2 due to the distance, presence of numerous large buildings in downtown Los Angeles, and the intervening topography (hills and mountains) between downtown Los Angeles and the beginning of Route 2 near La Canada/Flintridge.

As shown in Table 3.1-3, the nearest roadway which is eligible for State Scenic Highway Designation, to either the Ports, the cargo transfer facilities serving the ports, along the Alameda Corridor, or the cargo transfer facilities in the City of Commerce, would be Route 1 (Pacific Coast Highway at State Route 19 – Lakewood Boulevard, in Long Beach) in the southernmost portion of Los Angeles County. It is approximately five miles from the cargo transfer facilities serving the Ports to the intersection of State Route 19 and Route 1 where it becomes eligible to become a State Scenic Highway. The potential locations for catenary overhead power lines (near Port facilities, transportation corridors and railyards) would not be visible to Route 1 at State Route 19 due to the numerous structures and topography between the two locations. There are no officially designated Scenic Highways or highways eligible for State Scenic Highway Designation in areas affected by construction of zero or near-zero emission equipment associated with the 2012 AQMP, therefore construction impacts on aesthetic impacts are considered to be less than significant.

Operational Activities: As discussed under construction activities, control measures associated with potential aesthetics impacts in the 2012 AQMP relate primarily to the potential installation of catenary lines (overhead power lines) to power zero and near-zero emission trucks and locomotives.

Aesthetic impacts from zero or near-zero emission equipment are primarily associated with the installation of catenary poles and overhead wires. The areas within the district where such equipment is being considered are primarily heavily industrialized areas and major transportation corridors. As noted in the previous section (Construction Activities), the heavily industrialized areas around the Ports, near the cargo transfer facilities serving the Ports, along existing transportation corridors such as the Alameda Corridor, and the cargo transfer railyards in the City of Commerce, are not near an officially designated Scenic Highway or a roadway eligible for State Scenic Highway Designation, i.e., the overhead lines would be at least five miles away. The overhead power lines and catenary system would not be visible from this distance to an officially designated Scenic Highway or to a roadway eligible for designation as a Scenic Highway. As such, implementation of the 2012 AQMP would not result in significant aesthetic impacts to scenic highways. Further, the catenary poles and overhead electric wires would largely be located in industrial areas and would be consistent with the existing industrial and urbanized visual setting. It is expected that electrical substations would also be located in industrial/commercial areas or near transportation corridors and would be appropriately designed (e.g., wood cladding on the exterior of substations, so that the substations would blend in with the existing environment).

Based on the above, implementation of the 2012 AQMP is not expected to result in a substantial adverse effect on scenic vistas, substantially damage any scenic resources, substantially degrade the existing visual character or quality of a site and its surroundings, or create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

4.1.5 Project-Specific Mitigation Measures

No significant aesthetic impacts were identified for the installation of catenary or overhead power lines associated with the 2012 AQMP so no mitigation measures are required.

REMAINING AESTHETIC IMPACTS: There are no remaining aesthetic impacts since no significant impacts are expected due to the installation of catenary or overhead power lines associated with the 2012 AQMP and, therefore, no mitigation measures are required.

4.1.6 Summary of Aesthetics Impacts

The following is the summary of the conclusions of the analysis of aesthetic impacts associated with implementation of the 2012 AQMP:

- The construction and operation of the catenary or overhead power lines that could be used to power zero and near-zero emission vehicles and locomotives are not expected to be visible to any Scenic Highway or any roadway eligible as a Scenic Highway. Additionally, the construction and operation of catenary or overhead power lines is not expected to result in substantial adverse effects on scenic vistas, substantially damage any scenic resources, substantially degrade the existing visual character or quality of a site and its surroundings, or create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. Therefore, aesthetics impacts associated with the 2012 AQMP are less than significant.

Summary of PM2.5 Control Measure Impacts: PM2.5 Control Measures were evaluated in the NOP/IS and it was determined that the PM2.5 Control Measures would not generate any potentially significant aesthetic impacts.

Summary of Ozone Control Measure Impacts: Three Ozone Control Measures could result in the construction of overhead catenary lines. However, the potential aesthetic impacts associated with the Ozone Control Measures were determined to be less than significant, as no scenic resources, scenic vistas, or scenic highways would be adversely impacted.

SUBCHAPTER 4.2

AIR QUALITY

4.2 AIR QUALITY

4.2.1 Introduction

The purpose of the 2012 AQMP is to establish a comprehensive program to lead the region into compliance with the federal 24-hour PM2.5 air quality standard, and to provide an update of the Basin's projections in meeting the federal 8-hour ozone standards. The 2012 AQMP proposes potential attainment demonstration of the federal PM2.5 standard by 2014 through adoption of all feasible measures. In addition, the 2012 AQMP would update specific elements of the previously approved 8-hour ozone SIP: 1) an updated emissions inventory and, 2) new control measures and commitments for emissions reductions to help fulfill the CAA Section 182 (e)(5) portion of the 8-hour ozone SIP.

This subchapter examines the secondary air pollutant emissions that could occur as a consequence of efforts to improve air quality (e.g., emissions from control equipment such as afterburners). The analysis is divided into the following sections: 2012 AQMP Control Measures with Secondary Air Quality Impacts, Future Air Quality Emission Inventories, 2012 AQMP Air Quality Modeling Results, Significance Criteria, Potential Impacts and Mitigation, Ambient Air Quality, and Summary of Secondary Air Quality Impacts.

4.2.2 2012 AQMP Control Measures with Potential Secondary Air Quality Impacts

The air quality impact analysis in this Final Program EIR identifies the net effect on air quality from implementing the 2012 AQMP. All control measures were analyzed to identify adverse impacts.

Evaluation of control measures was based on examination of the impact of the control measures and technologies focusing on potential secondary air quality impacts. Evaluation of control methods for each control measure indicated that there are 27 control measures that could have potential secondary air quality impacts. As shown in Table 4.2-1, four control measures are to reduce short-term PM2.5 emissions and 23 control measures are to reduce ozone formation.

TABLE 4.2-1

Control Measures with Potential Secondary Air Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	AIR QUALITY IMPACT
SHORT-TERM PM2.5 CONTROL MEASURES			
BCM-03 (*formerly BCM-05*)	Emission Reductions from Under-Fired Charbroilers	Add-On Control Equipment with Ventilation Hood Requirements (e.g., ESPs, HEPA filters, wet scrubbers, and thermal oxidizers).	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant, GHG emissions from operation of control technology and electricity generation.

TABLE 4.2-1 (CONTINUED)

Control Measures with Potential Secondary Air Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	AIR QUALITY IMPACT
OZONE CONTROL MEASURES			
BCM-04 (formerly MCS-04B)	Further Ammonia Reductions from Livestock Waste (NH3)	Reducing pH level in manure through the application of acidifier sodium bisulfate to	Potential increase in diesel fuel use for delivery and application of acidifier.
CMB-01	Further NOx Reductions from RECLAIM – *Phase I and Phase II* (NOx)	Cement kilns, glass furnaces, and gas turbines were not subject to reduction in the 2005 RECLAIM rule amendment. These sources will be examined for further reductions in this control measure and potential rule making. Selective catalytic reduction, low NOx burners, NOx reducing catalysts, oxy-fuel furnaces, and selective non-catalytic reduction.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from operation of control technology and electricity generation. Potential increase in ammonia emissions.
IND-01[a]	Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities (NOx, SOx, PM2.5)	Environmental lease conditions, port rules, tariffs or incentives.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from and electricity generation. Additional emission controls could result in increased electricity use. Increased use of alternative fuels. Potential decrease in engine efficiency could reduce fuel economy. Potential increase in ammonia emissions.
MCS-01[a]	Application of All Feasible Measures Assessment (All Pollutants)	District would adopt and implement new retrofit technology control standards as new BARCT standards become available.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from operation of control technology and electricity generation.
MCS-02	Further Emission Reductions from Green Waste Processing (Chipping and Grinding Operations not associated with composting) (VOC)	Require chipped or ground greenwaste material to be covered after chipping or grinding or removed from site; and seasonal covering of chipped or ground greenwaste material.	Potential increase in truck trips.
CMB-02	NOx Reductions from Biogas Flares (NOx)	Replacement of existing biogas flares with more efficient biogas flares	Potential criteria pollutant and GHG emissions from construction.
CMB-03	Reductions from Commercial Space Heating (NOx)	This control measure seeks emission reductions from unregulated commercial fan-type central furnaces used for space heating.	Potential criteria pollutant and GHG emissions from construction

TABLE 4.2-1 (CONTINUED)

Control Measures with Potential Secondary Air Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	AIR QUALITY IMPACT
OZONE CONTROL MEASURES			
CTS-01	Further VOC Reductions from Architectural Coatings (R1113) (VOC)	Reduce the allowable VOC content in product formulations by using alternative low-VOC products & use application techniques with greater transfer efficiency.	Potential change in use of VOC and toxic air contaminants from reformulation.
CTS-02	Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants (VOC)	Reduce the allowable VOC content in product formulations by using alternative low-VOC products or non-VOC product/equipment.	Potential change in use of VOC and toxic air contaminants from reformulation.
CTS-03	Further VOC Reductions from Mold Release Products (VOC)	Limitation of VOC content for mold release products.	Potential change in use of VOC and toxic air contaminants from reformulation.
CTS-04	Further VOC Reductions from Consumer Products (VOC)	Eliminate or revise the exemption for low vapor pressure solvents in consumer products.	Potential change in use of VOC and toxic air contaminants from reformulation.
FUG-01	~~Further~~ VOC Reductions from Vacuum Trucks (VOC)	VOC control devices such as carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers, liquid scrubbers and positive displacement (PD) pumps.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from operation of control technology and catalyst replacement.
FUG-02	Emission Reduction from LPG Transfer and Dispensing – Phase II (VOC)	Expand applicability of rule to LPG transfer and dispensing at facilities other than those that offer LPG for sale to end users included currently exempted facilities.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from vehicles used for inspection and monitoring.
FUG-03	Further ~~VOC~~ Reductions from Fugitive VOC Emissions (VOC)	Upgrade inspection/ maintenance rules to at least a self-inspection program, or to an optical gas imaging-assisted LDAR program where feasible; use of new technologies to detect and verify VOC fugitive emissions	Potential criteria pollutant and GHG emissions from construction and monitoring/inspections.
MCS-01	Application of All Feasible Measures Assessment (All Pollutants)	SCAQMD would adopt and implement new retrofit technology control standards as new BARCT standards become available.	Potential criteria pollutant and GHG emissions from construction.

TABLE 4.2-1 (CONTINUED)

Control Measures with Potential Secondary Air Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	AIR QUALITY IMPACT
OZONE CONTROL MEASURES			
MCS-02	Further Emission Reductions from Green Waste Processing (Chipping and Grinding Operations not associated with composting) (VOC)	Require chipped or ground greenwaste material to be covered after chipping or grinding or removed from site, and seasonal covering of chipped or ground greenwaste material.	Potential criteria pollutant and GHG emissions from construction.
MCS-03	Improved Start-up, Shutdown and Turnaround Procedures (All Pollutants)	Diverting or eliminating process streams that are vented to flares, and installing redundant equipment to increase operational reliability	Potential criteria pollutant and GHG emissions from construction.
INC-01	Economic Incentive Programs to Adopt Zero and Near-Zero Technologies (NOx)	Installation of cleaner, more efficient combustion equipment, such as boilers, water heaters and commercial space heating or installation of control technologies including fuel cells, diesel particulate filters (DPF), NOx reduction catalysts, alternative electricity generation, such as wind and solar, battery electric, hybrid electric, and usage of low NOx and alternative fuels such as natural gas	Potential criteria pollutant and GHG emissions from construction and related filter and/or catalyst replacement.
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles (VOC, NOx, PM)	Incentives to replace older vehicles with electric or hybrid vehicles.	Potential criteria pollutant, toxic air pollutant and GHG emissions from and electricity generation.
ONRD-02	Accelerated Retirement of Older Light-Duty and Medium-Duty Vehicles (VOC, NOx, PM)	Incentives to replace older light- and medium-duty vehicles with new or newer low-emitting vehicles.	Potential criteria pollutant, toxic air pollutant and GHG emissions from and electricity generation.
ONRD-03	Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium Heavy-Duty Vehicles (NOx, PM)	Incentives to replace older medium-duty vehicles with low-emitting vehicles. Highest priority would be given to zero-emission vehicles and hybrid vehicles with a portion of their operation in an “all electric range” mode.	Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation.

TABLE 4.2-1 (CONTINUED)

Control Measures with Potential Secondary Air Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	AIR QUALITY IMPACT
OZONE CONTROL MEASURES			
ONRD-04	Accelerated Retirement of Older On-Road Heavy-Duty Vehicles (NOx, PM)	Incentives replace heavy-duty vehicles with newer or new vehicles. Priority would be placed on replacing older diesel trucks in Mira Loma.	Potential emissions from demolition of retired vehicles.
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards (NOx, PM)	Incentives to replace up to 1,000 heavy-duty vehicles with low-emitting vehicles or zero-emission container movement systems.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation.
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment (NOx)	Accelerate equipment replacement, use of air pollution control technologies (e.g., advanced fuel injection, air induction, and after-treatment technologies).	Potential increase in the use of alternative fuels.
OFFRD-02	Further Emission Reductions from Freight Locomotives (NOx, PM)	Replace existing engines with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation. Potential increased use of alternative fuels. Potential decrease in engine efficiency could reduce fuel economy. Potential increase in ammonia emissions.
OFFRD-03	Further Emission Reductions from Passenger Locomotives (NOx, PM)	Repower existing engines with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation. Potential increased use of alternative fuels. Potential decrease in engine efficiency could reduce fuel economy. Potential increase in ammonia emissions.
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels at Berth (VOC, NOx, PM)	Shore power of vessels at berth, use of air pollution control technologies on exhaust gases from auxiliary engines and boilers (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Potential increase in electricity associated with increased use of shore-side power and additional air pollution control technologies. Construction emissions. Potential decrease in engine efficiency could reduce fuel economy and increase emissions. Potential ammonia emissions.

TABLE 4.2-1 (CONTINUED)

Control Measures with Potential Secondary Air Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	AIR QUALITY IMPACT
OZONE CONTROL MEASURES			
ADV-01	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles (NOx)	Construct "wayside" electric or magnetic infrastructure, construction battery charging and fueling infrastructure.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation. Potential increased use of alternative fuels.
ADV-02	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives (NOx)	Construct "wayside" electric, magnetic, battery-hybrid system, or fuel cell infrastructure, construct battery charging or fueling infrastructure.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation. Potential increased use of alternative fuels.
ADV-03	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment (NOx)	Construct electric gantry cranes, construct battery charging or fueling infrastructure, and use of alternative fuels.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation.
ADV-04	Actions for the Deployment of Cleaner Commercial Harborcraft (NOx)	Construct battery charging or fueling infrastructure, use of air pollution control equipment (e.g., SCR, and use of alternative fuels).	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation. Potential increased use of alternative fuels. Potential decrease in engine efficiency could reduce fuel economy. Potential increase in ammonia emissions.
ADV-05	Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels (NOx)	Employ after treatment control technologies such as SCR and sea water scrubbers, and use of alternative fuels.	Potential criteria pollutant and GHG emissions from construction. Potential criteria pollutant, toxic air pollutant and GHG emissions from electricity generation. Potential increased use of alternative fuels. Potential decrease in engine efficiency could reduce fuel economy. Potential increase in ammonia emissions.

TABLE 4.2-1 (CONCLUDED)

Control Measures with Potential Secondary Air Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	AIR QUALITY IMPACT
OZONE CONTROL MEASURES			
ADV-06	Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment (NOx)	Construct battery charging or fueling infrastructure, and increased use of alternative fuels.	Potential criteria pollutant, toxic air pollutant and GHG emissions from and electricity generation. Potential increased use of alternative fuels. Potential decrease in engine efficiency could reduce fuel economy. Potential increase in ammonia emissions.
ADV-07	Proposed Implementation Measures for the Deployment of Cleaner Aircraft Engines (NOx)	Use alternative fuels, lean combustion burners, high rate turbo bypass, advanced turbo-compressor design, and engine weight reduction.	Potential increased use of alternative fuels.

[a] The specific actions associated with the control measure are unknown and, therefore, the impacts are speculative. In order to provide a conservative analysis, it is assumed that the control measure could require air pollution control technologies that are similar to those that are currently required (e.g., SCR, electrification, use of alternative fuels, etc., and would have the potential to require construction activities that would generate noise).

4.2.3 Significance Criteria

To determine whether or not air quality impacts from the 2012 AQMP are significant, impacts will be evaluated and compared to the significance criteria in Table 4.2-2. If impacts equal or exceed any of the criteria in Table 4.2-2, they will be considered significant.

TABLE 4.2-2

Air Quality Significance Thresholds

MASS DAILY THRESHOLDS[(a)]		
POLLUTANT	**CONSTRUCTION[(b)]**	**OPERATION[(c)]**
NO_x	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day

TABLE 4.2-2 (CONCLUDED)

Air Quality Significance Thresholds

TOXIC AIR CONTAMINANTS, ODOR, AND GHG THRESHOLDS	
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk $\geq$ 10 in 1 million Chronic and Acute Hazard Index $\geq$ 1.0 (project increment) Cancer Burden $\geq$ 0.5 excess cancer cases (in areas $\geq$ 1 in 1 million)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
GHG	10,000MT/yr CO_2eq for industrial facilities
Ambient Air Quality for Criteria Pollutants[d]	
NO_2 1-hour average annual average	In attainment; significant if project causes or contributes to an exceedance of any standard: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)
PM10 24-hour annual average	10.4 $\mu g/m^3$ (construction)[e] and 2.5 $\mu g/m^3$ (operation) 1.0 $\mu g/m^3$
PM2.5 24-hour average	10.4 $\mu g/m^3$ (construction)[e] and 2.5 $\mu g/m^3$ (operation)
SO_2 1-hour average 24-hour average	0.255 ppm (state) and 0.075 ppm federal – 99th percentile) 0.04 ppm (state)
Sulfate 24-hour average	25 $\mu g/m^3$ (state)
CO 1-hour average 8-hour average	In attainment; significant if project causes or contributes to an exceedance of any standard: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)
Lead 30-day average Rolling 3-month average Quarterly average	1.5 µg/m3 (state) 0.15µg/m3 (federal) 1.5µg/m3 (federal)

a) Source: SCAQMD CEQA Handbook (SCAQMD, 1993)
b) Construction thresholds apply to both the SCAB and Coachella Valley (Salton Sea and Mojave Desert Air Basin)
c) For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.
d) Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
e) Ambient air quality threshold based on SCAQMD Rule 403.

KEY: ppm = parts per million; $\mu g/m^3$ = microgram per cubic meter; lbs/day = pounds per day; MT/yr CO2eq = metric tons per year of CO_2 equivalents; ≥ greater than or equal to; > = greater than

4.2.4 Future Air Quality Emission Inventories

Figure 4.2-1 and 4.2-2 show baseline and future projected emissions, respectively, by major source categories. These figures are included here to show projected air quality trends through 2023. Baseline emissions for major source categories (e.g., point, area, on-road, and off-road) in 2008 are provided in Figure 4.2-1. Figure 4.2.-2 shows the projected future 2023 emission inventory that would be expected if no new AQMP control measures are promulgated as rules. It does, however, reflect emission reductions for existing rules with future compliance dates. A comparison of Figures 4.2-1 and 4.2-2 indicates the following:

- Consumer products continue to be the major contributor of VOC emissions with on-road vehicles declining from 19 percent in 2008 (121 tons per day) to 25 percent in 2023 (110 tons per day). The contribution to VOC emissions from off-road equipment decreases from 26 percent in 2008 (166 tons per day) to 25 percent in 2023 (110 tons per day). The on-road vehicle emissions decrease from 33 percent in 2008 (211 tons per day) to 16 percent (70 tons per day) due to more-stringent on-road standards in the future. Overall, on-road and off-road source combined contribution decreases from 59 percent (377 tons per day) in 2008 to 41 percent (180 tons per day) in 2023.

- The contribution of SOx emissions from off-road sources including marine vessels decreases from 71 percent in 2008 (38 tons per day) to 32 percent in 2023 (six tons per day) due to more-stringent fuel standards.

- The contribution to NOx emissions from off-road equipment increases from 29 percent in 2008 (~~209~~ 208 tons per day) to ~~43~~ 42 percent in 2023 (~~135~~ 133 tons per day) as the on-road vehicle emissions decrease from 59 percent in 2008 (~~425~~ 426 tons per day) to ~~37~~ 36 percent (~~116~~ 117 tons per day) due to more-stringent on-road standards in the future. It is important to note that the contribution of total NOx emissions increases for off-road equipment, but the NOx emissions from off-road equipment still decreases. Overall, on-road and off-road source combined contribution decreases from 88 percent (634 tons per day) of the emissions in 2008 to ~~80~~ 82 percent in 2023 (250 tons per day).

- The contribution to CO emissions from off-road equipment decreases from 68 percent in 2008 (1,959 tons per day) to 52 percent in 2023 (823 tons per day). The on-road vehicle emissions increases from 27 percent in 2008 (778 tons per day) to 38 percent (602 tons per day) due to more-stringent on-road standards in the future. Overall, on-road and off-road source combined contribution decreases from 95 percent (2,737 tons per day) of the emissions in 2008 to 90 percent in 2023 (1,425 tons per day).

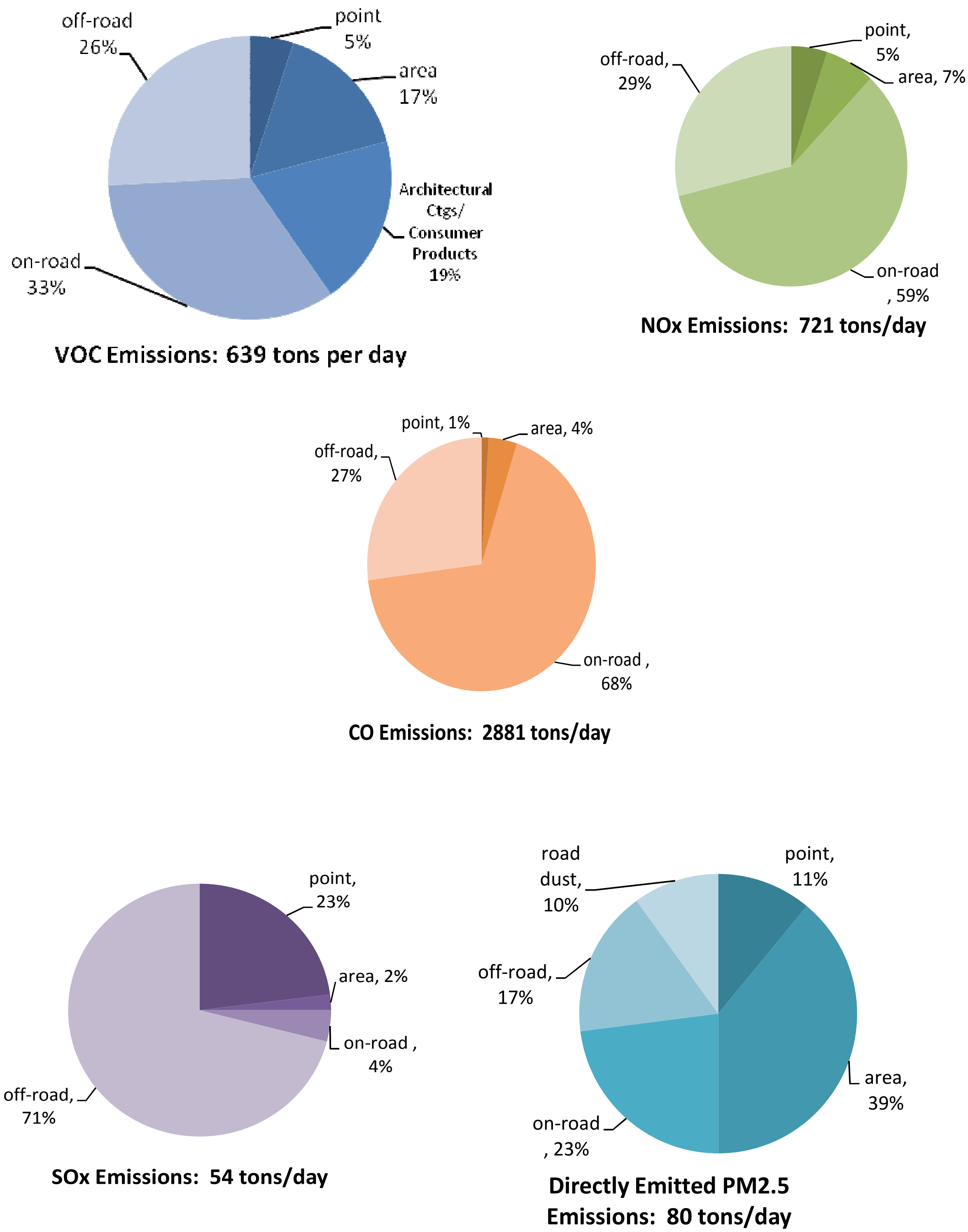

FIGURE 4.2-1

Relative Contribution by Source Category to 2008 Emission Inventory
(VOC & NOx – Summer Planning; CO, SOx, & PM2.5 – Annual Average Inventory)

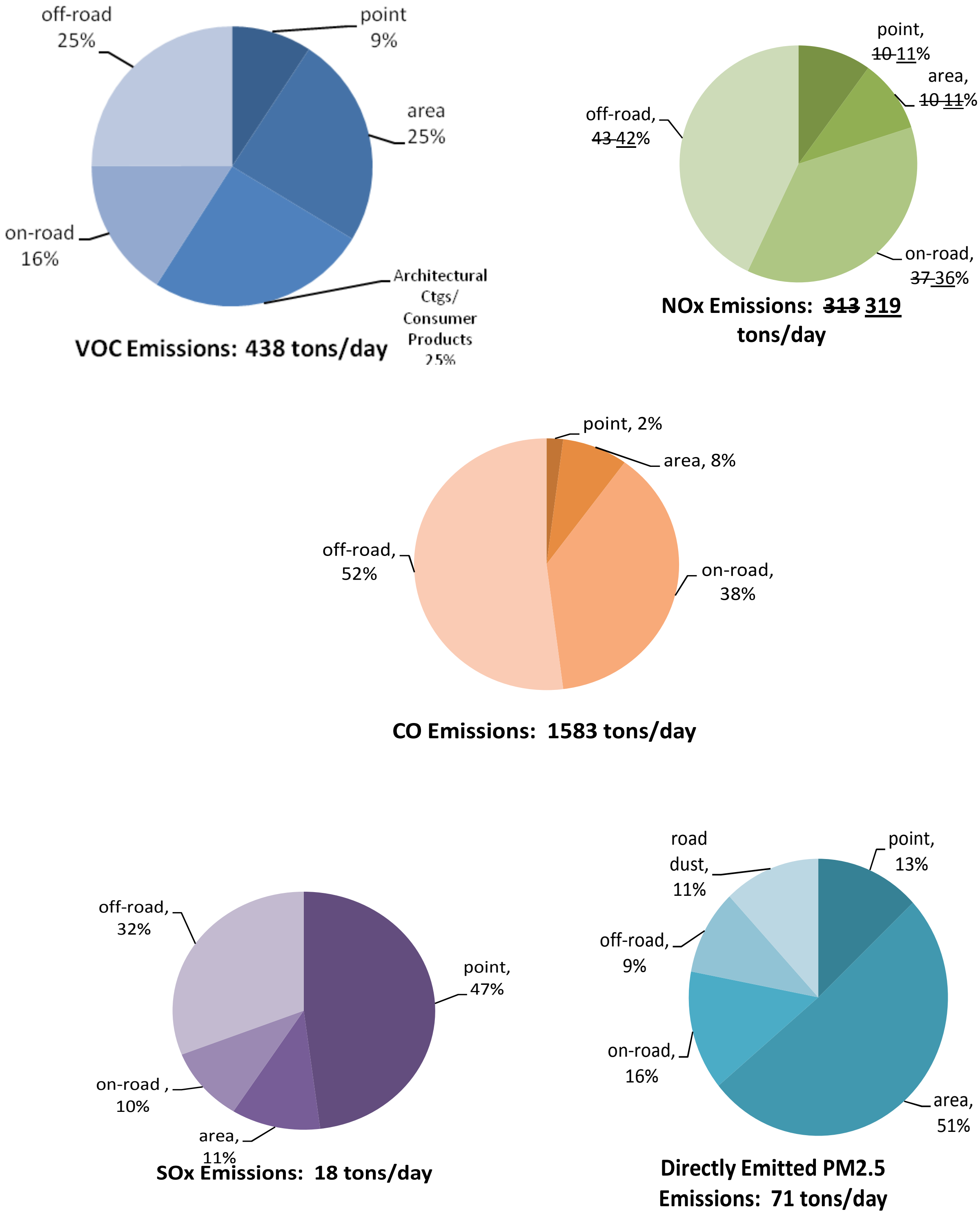

FIGURE 4.2-2

Relative Contribution by Source Category to 2023 Emission Inventory
(VOC & NOx – Summer Planning; CO, SOx, & PM2.5 – Annual Average Inventory)

- The major contributor of PM2.5 emissions is area sources at 39 percent in 2008 (31 tons per day), which increases to 51 percent in 2023 (36 tons per day) primarily due to the reduction in on- and off-road source emissions. The contribution to PM2.5 emissions from off-road equipment decreases from 17 percent in 2008 (14 tons per day) to nine percent in 2023 (six tons per day). The on-road vehicle emissions decrease from 23 percent in 2008 (18 tons per day) to 16 percent (11 tons per day) due to more-stringent on-road standards in the future. Overall, on-road and off-road source combined contribution decreases from 40 percent (32 tons per day) in 2008 to 25 percent (18 tons per day) in 2023.
- Emission reductions from the 2008 to 2023 are expected due to the effect of more-stringent on-road standards in the future.

4.2.5 2012 AQMP Air Quality Modeling Results

The objective of the 2012 AQMP is to attain and maintain ambient air quality standards. The purpose of the 2012 AQMP is to set forth a comprehensive and integrated program that will lead the Basin into compliance with the federal 24-hour PM2.5 air quality standard, and to provide an update of the Basin's projections in meeting the federal 8-hour ozone standards. The 2012 AQMP demonstrates attainment of the federal 24-hour PM2.5 standard by 2014 in the Basin through adoption of all feasible measures (see Table 4.2-3).

The Basin is currently designated nonattainment for PM2.5, and extreme nonattainment for ozone. Table 4.2-3 shows the attainment designation and date when attainment would be achieved.

4.2.5.1 PM2.5 Air Quality

Within the Basin, PM2.5 particles are either directly emitted into the atmosphere (primary particles), or are formed through atmospheric chemical reactions from precursor gases (secondary particles). Primary PM2.5 includes road dust, diesel soot, combustion products, and other sources of fine particles. Secondary products, such as sulfates, nitrates, and complex carbon compounds are formed from reactions with oxides of sulfur, oxides of nitrogen, VOCs, and ammonia.

The U.S. EPA supported Community Multiscale Air Quality (CMAQ) (version 4.7) modeling platform with SAPRC99 chemistry and Weather Research and Forecasting Model (WRF) meteorology is used as the primary tool to demonstrate future year attainment of the 24-hour average PM2.5 standard in the 2012 AQMP. A detailed discussion of the features of the CMAQ approach is presented in Appendix V of the 2012 AQMP. The analysis was also conducted using the Comprehensive Air Quality Model with Extensions (CAMx) modeling platform using the "one atmosphere" approach comprised of the SAPRC99 gas phased chemistry and a static two-mode particle size aerosol module as the particulate modeling platform. Parallel testing was conducted to evaluate the CMAQ performance against CAMx and the results indicated that the two model/chemistry packages had similar performance. The CAMx results are provided in Appendix V of the 2012 AQMP as a component of the weight of evidence discussion.

TABLE 4.2-3

Expected Year of Compliance with Federal Ambient Air Quality Standards

CRITERIA POLLUTANT	AVERAGING TIME	DESIGNATION [a]	ATTAINMENT DATE [b]
1979 **1-Hour Ozone**[c]	1-Hour (0.12 ppm)	Nonattainment (Extreme)	11/15/2010 (Not Attained)[c]
1997 **8-Hour Ozone**[d]	8-Hour (0.08 ppm)	Nonattainment (Extreme)	6/15/2024
2008 **8-Hour Ozone**	8-Hour (0.075 ppm)	Nonattainment (Extreme)	12/31/2032
CO	1-Hour (35 ppm) 8-Hour (9 ppm)	Attainment (Maintenance)	6/11/2007 (Attained)
NO_2[e]	1-Hour (100 ppb)	Unclassifiable/Attainment	Attained
	Annual (0.053 ppm)	Attainment (Maintenance)	9/22/1998
SO_2[f]	1-Hour (75 ppb)	Designations Pending	Pending
	24-Hour (0.14 ppm) Annual (0.03 ppm)	Unclassifiable/Attainment	3/19/1979 (Attained)
PM10	24-hour (150 µg/m^3)	Nonattainment (Serious)[g]	12/31/2006 (Redesignation request submitted)[g]
PM2.5	24-Hour (35 µg/m^3)	Nonattainment	12/14/2014[h]
	Annual (15.0 µg/m^3)	Nonattainment	4/5/2015
Lead	3-Months Rolling (0.15 µg/m^3)	Nonattainment (Partial)[i]	12/31/2015

U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

a) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for attainment demonstration
b) 1-hour O_3 standard (0.12 ppm) was revoked, effective June 15, 2005 ; however, the Basin has not attained this standard based on 2008-2010 data and has some continuing obligations under the former standard
c) The 1997 8-hour O_3 standard (0.08 ppm) was reduced (0.075 ppm), effective May 27, 2008; the 1997 O_3 standard and most related implementation rules remain in place until the 1997 standard is revoked by U.S. EPA
d) New NO_2 1-hour standard, effective August 2, 2010; attainment designations January 20, 2012; annual NO_2 standard retained
e) The 1971 annual and 24-hour SO_2 standards were revoked, effective August 23, 2010; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard. Area designations are expected in 2012, with Basin designated Unclassifiable /Attainment
f) Annual PM10 standard was revoked, effective December 18, 2006; redesignation request to Attainment of the 24-hour PM10 standard is pending with U.S. EPA
g) Attainment deadline for the 2006 24-Hour PM2.5 NAAQS is December 14, 2014
h) Partial Nonattainment designation – Los Angeles County portion of Basin only

The 2012 AQMP modeling attainment demonstrations using the CMAQ (and CAMx) platform were conducted in a vastly expanded modeling domain compared with the analysis conducted for the 2007 AQMP modeling attainment demonstration. In this analysis, the PM2.5 and ozone base and future simulations were modeled simultaneously. The simulations were conducted using a Lambert Conformal grid projection where the western boundary of the domain was extended to 084 UTM, over 100 miles west of the ports of Los Angeles and Long Beach. The eastern boundary extended beyond the Colorado river, while the northern and southern boundaries of the domain extend to the San Joaquin Valley and the Northern portions of Mexico (3543 UTM). The grid size has been reduced from five kilometers squared to four kilometers squared and the vertical resolution has been increased from 11 to 18 layers.

The final WRF meteorological fields were generated for the identical domain, layer structure and grid size. The WRF simulations were initialized from National Centers for Environmental Prediction (NCEP) analyses and run for three-day increments with the option for four dimensional data assimilation (FDDA). Horizontal and vertical boundary conditions were designated using a "U.S. EPA clean boundary profile."

PM2.5 data measured as individual species at six-sites in the SCAQMD's air monitoring network during 2008 provided the characterization for evaluation and validation of the CMAQ annual and episodic modeling. The six sites include the historical PM2.5 maximum location (Riverside- Rubidoux), the stations experiencing many of the highest county concentrations (among the four-county jurisdiction including Fontana, North Long Beach and Anaheim) and source oriented key monitoring sites addressing goods movement (South Long Beach) and mobile source impacts (Central Los Angeles). It is important to note that the close proximity of Mira Loma to Rubidoux and the common in-Basin air flow and transport patterns enable the use of the Rubidoux speciated data as representative of the particulate speciation at Mira Loma. Both sites are directly downwind of the dairy production areas in Chino and the warehouse distribution centers located in the northwestern corner of Riverside County. Speciated data monitored at the selected sites for 2006-2007 and 2009-2010 were analyzed to corroborate the applicability of using the 2008 profiles.

Day-specific point source emissions were extracted from the SCAQMD's ~~District~~ stationary source and RECLAIM inventories. Mobile source emissions included weekday, Saturday and Sunday profiles based on CARB's EMFAC2011 emissions model, CALTRANS weigh-in-motion profiles, and vehicle population data and transportation analysis zone (TAZ) data provided by SCAG. The mobile source data and selected area source data were subjected to daily temperature corrections to account for enhanced evaporative emissions on warmer days. Gridded daily biogenic VOC emissions were provided by CARB using BEIGIS biogenic emissions model. The simulations benefited from enhancements made to the emissions inventory including an updated ammonia inventory, improved emissions characterization that split organic compounds into coarse, fine, and primary particulate categories, and updated spatial allocation of primary paved road dust emissions.

Model performance was evaluated against speciated particulate PM2.5 air quality data for ammonium, nitrates, sulfates, secondary organic matter, elemental carbon, primary and total particulate mass for the six monitoring sites (Rubidoux, Central Los Angeles, Anaheim, South Long Beach, Long Beach, and Fontana).

4.2.5.2 Ozone Air Quality

The 2007 AQMP provided a comprehensive 8-hour ozone analysis that demonstrated future year attainment of the 1997 federal ozone standard (80 ppb) by 2023 with implementation of short-term measures and CAA Section 182 (e)(5) long term emissions reductions. The analysis concluded that NOx emissions needed to be reduced approximately 76 percent and VOC 22 percent from the 2023 baseline in order to demonstrate attainment. The 2023 base year VOC and NOx summer planning emissions inventories included 536 and 506 tons per day, respectively.

As presented in Chapter 3 of the 2012 AQMP, the 2012 AQMP controlled 2023 emissions of both precursor pollutants are estimated to be lower than the 2023 baseline established in the 2007 AQMP. The 2023 baseline VOC and NOx emission summer planning emissions have been revised to 434 and 313 tons per day, respectively. The emissions revision incorporated changes made to the on-road truck and off-road equipment categories that resulted from CARB rulemaking. The new emissions inventory also reflects the impact of the economic slowdown and revisions to regional growth estimates. As a consequence, it is important to revisit the projections of 2023 baseline ozone to investigate the impact of the inventory revision on the attainment demonstration and equally important, what is the impact on the size of the proposed long term NOx emissions reduction commitment.

4.2.6 Potential Secondary Air Quality Impacts and Mitigation Measures

Secondary air quality impacts are potential increases in air pollutant that can occur directly or indirectly from implementation of control measures in the 2012 AQMP. SCAQMD evaluated all 2012 AQMP control measures to identify those control measures that have the potential to generate secondary adverse air quality impacts. Table 4.2-1 identifies all control measures that have the potential to generate secondary air quality impacts. All air quality impacts identified in this subchapter are based on impacts from control measures identified in Table 4.2-1.

4.2.6.1 Criteria Pollutants - Construction Activities

Regulation of Port and Port-Related Sources: In 2006 the Ports of Los Angeles and Long Beach, with the participation and cooperation of the staff of the SCAQMD, CARB, and U.S. EPA, adopted the San Pedro Bay Ports Clean Air Action Plan (CAAP). The CAAP was further amended in 2010, updating many of the goals and implementation strategies to reduce air emissions and health risks associated with port operations while allowing port development to continue. In addition to addressing health risks from port-related sources, the CAAP sought the reduction of criteria pollutant emissions to the levels that assure port-related sources decrease their “fair share” of regional emissions to enable the Basin to attain state and federal ambient air quality standards. The IND-01 control measure is the “backstop” for the CAAP.

IND-02 would establish enforceable nonattainment pollutant emission reduction goals for the ports in order to ensure attainment of the 24-hr PM2.5 attainment strategy in the 2012 AQMP. IND-02 would be implemented if aggregate emissions from port-related sources exceed specified emissions targets. If emissions do not exceed such targets, the ports would have no further control obligations and this control measure would not need to be implemented.

The overall impact of the CAAP is beneficial to air quality; however, implementation of some of the control measures in the CAAP will generate secondary impacts to air quality from infrastructure projects construction, increased electricity usage, and increased production of alternative fuels. Although the secondary air quality impacts from construction of infrastructure projects cannot be quantified from data in the CAAP, it is expected that construction to install the electrical distribution network in the Ports of Long Beach and Los Angeles as well as implement other control measures will require an intensive effort and is expected to have short-term significant air quality impacts.

4.2.6.1.1 General Construction Emissions from Control Measures

While implementing the 2012 AQMP control measures is expected to reduce operational emissions, construction-related activities associated with installing or replacing equipment, for example, are expected to generate emissions from construction worker vehicles, trucks, and construction equipment. Implementation of some of the measures in the 2012 AQMP would require constructing the following types of new infrastructure including: 1) additional infrastructure to support alternative-fueled vehicles (electric, hydrogen, natural gas); 2) additional infrastructure to support electrification of new sources (e.g., additional on-road vehicles and marine vessels, "wayside" electric or magnetic power such as catenary lines); and, 3) construction of controls at stationary sources (e.g., SCRs, particulate controls, and vapor recovery systems). The following control measures in the 2012 AQMP may require construction activities in connection with implementing the emission control requirements, BCM-03 - Emission Reductions from Under-Fired Charbroilers, CMB-01 - Further NOx Reductions from RECLAIM – *Phase I and Phase II*, CMB-02 - NOx Reductions from Biogas Flares, CMB-03 - Reductions from Commercial Space Heating, IND-01 - Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities, FUG-01 - ~~Further~~ VOC Reductions from Vacuum Trucks, FUG-02 - Emission Reduction from LPG Transfer and Dispensing – Phase II, FUG-03 - Further ~~VOC~~ Reductions from Fugitive VOC Emissions, MCS-01 - Application of All Feasible Measures Assessment, MCS-03 - Improved Start-up, Shutdown and Turnaround Procedures, INC-01 - Economic Incentive Programs to Adopt Zero and Near-Zero Technologies, OFFRD-01 - Extension of the SOON Provision for Construction/Industrial Equipment, OFFRD-04 - Further Emission Reductions from Ocean-Going Marine Vessels at Berth, ONRD-03 - Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium Heavy-Duty Vehicles, ONRD-05 - Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards, ADV-01 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles, ADV-02 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives, ADV-03 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment, ADV-04 - Actions for the Deployment of Cleaner Commercial Harborcraft, ADV-05 - Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels, and ADV-06 - Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment.

The inventory prepared for the 2012 AQMP includes emissions estimates associated with construction activities, which are summarized in Table 4.2-4 for the key years of 2014 and 2023. It is assumed that the following types of construction activities to implement AQMP control measures contribute to construction activities emission inventories: 1) additional infrastructure to support electric and alternative fuel vehicles; 2) additional infrastructure for stationary source controls; and, 3) additional infrastructure to support electrification of new sources. Table 4.2-4 also presents comparisons of the future construction emission inventories to the year 2008 baseline emissions inventory. For 2023, emissions of CO and PM10 are expected to be significant without an estimate of construction associated with the proposed control measures. The scope of the construction to implement the proposed control measures is not known at this time. However, additional construction to implement the proposed measures could potentially increase the construction emissions and, therefore would be considered potentially significant.

TABLE 4.2-4

Annual Average Construction Emissions by Source Category in the District
(tons/day)

Source Category	VOC	CO	NOx	SOx	PM10	PM2.5
2008 Emission Inventory						
Construction and Demolition	--	--	--	--	21	2
Off-Road Equipment	64	606	94	0.08	5.8	5.4
2008 Total	64	606	94	0.08	27	7.5
2014 Emission Inventory						
Construction and Demolition	--	--	--	--	19	1.9
Off-Road Equipment	49	594	66	0.08	4.3	4.0
2014 Total	49	594	66	0.08	24	5.9
Emission Increase (emissions in 2014 – emission in 2008)	-15	-12	-28	0	-3.3	-1.6
Emissions Increase (lbs/day)	-30,320	-23,620	-56,980	0	-6,500	-3,120
SCAQMD Significance Thresholds (lbs/day)	75	550	700	150	150	55
Significant?	NO	NO	NO	NO	NO	NO
2023 Emissions Inventory						
Construction and Demolition	--	--	--	--	27	2.7
Off-Road Equipment	43	633	44	0.11	3.0	2.8
2023 Total	43	633	44	0.11	30	5.5
Emission Increase (emissions in 2023 – emission in 2008)	-21	27	-50	0.03	3.0	-2.0
Emissions Increase (lbs/day)	-42,820	53,300	-100,200	60	6,040	-3,920
SCAQMD Significance Thresholds (lbs/day)	75	550	100	150	150	55
Significant?	NO	YES	NO	NO	YES	NO

Source: SCAQMD, 2012
Note: Negative numbers represent emissions reductions.

The SCAQMD has developed localized significance thresholds for criteria pollutant emissions to determine whether or not a project may generate significant adverse localized air quality impacts. An analysis of localized air quality impacts for criteria pollutant emissions is not applicable to regional projects such as local general plans, specific plans, or AQMPs (SCAQMD, 2008) because the details of the individual projects to implement the these types of plans and their locations are not known at this time. Therefore, a localized air quality impact analysis has not been performed for the 2012 AQMP in this Final Program EIR.

PROJECT-SPECIFIC MITIGATION: Mitigation measures are required to minimize the significant air quality impacts associated with the potential significant construction impacts on air quality. The following feasible mitigation measures are required:

On-Road Mobile Sources:

AQ-1 Develop a Construction Emission Management Plan for the proposed project. The Construction Emission Management Plan shall be submitted to SCAQMD CEQA for approval prior to the start of construction. The Plan shall include measures to minimize emissions from vehicles including, but not limited to consolidating truck deliveries, description of truck routing, description of deliveries including hours of delivery, description of entry/exit points, locations of parking, and construction schedule. At a minimum the Construction Emission Management Plan would include the following types of mitigation measures.

Off-Road Mobile Sources:

AQ-2 Maintain construction equipment tuned up and with two to four degree retard diesel engine timing or tuned to manufacturer's recommended specifications that optimize emissions without nullifying engine warranties.

AQ-3 The project proponent shall survey and document the proposed project's construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Emissions Management Plan. Electric welders shall be used in all construction areas that are demonstrated to be served by electricity.

AQ-4 The project proponent shall survey and document the proposed Project's construction areas and identify all construction areas that are served by electricity. This documentation shall be provided as part of the Construction Emissions Management Plan. Onsite electricity rather than temporary power generators shall be used in all construction areas that are demonstrated to be served by electricity.

AQ-5 The project proponent shall use cranes rated 200 hp or greater equipped with Tier 3 or equivalent engines. Engines equivalent to Tier 3 may consist of Tier 2 engines retrofitted with diesel particulate filters and oxidation catalysts, selective catalytic reduction, or other equivalent NOx control equipment. Retrofitting cranes rated 200 hp or greater with PM and NOx control devices must occur before the start of construction. If cranes rated 200 hp or greater equipped with Tier 3 engines are not available or cannot be retrofitted with PM and NOx control devices, the project proponent shall use cranes rated 200 hp or greater equipped with Tier 2 or equivalent engines. The project proponent shall provide documentation that cranes rated 200 hp or greater equipped with Tier 3 or equivalent engines are not available in the Construction Emissions Management Plan.

AQ-6 For off-road construction equipment rated 50 to 200 hp that will be operating for eight hours or more, the project proponent shall use equipment rated 50 to 200 hp equipped with Tier 3 or equivalent engines. Engines equivalent to Tier 3 may consist of Tier 2 engines retrofitted with diesel particulate filters and oxidation catalysts, selective catalytic reduction, or other equivalent NOx control equipment Retrofitting equipment rated 50 to 200 hp with PM and NOx control devices must occur before the start of construction If equipment rated 50 to 200 hp equipped with Tier 3 engines are not available or cannot be retrofitted with PM and NOx control devices, the project proponent shall use equipment rated 50 to 200 hp equipped with Tier 2 or equivalent engines. The project proponent shall provide documentation that equipment rated 50 to 200 hp equipped with Tier 3 or equivalent engines are not available in the Construction Emissions Management Plan or associated subsequent status reports as information becomes available.

AQ-7 Suspend use of all construction activities that generate air pollutant emissions during first stage smog alerts.

As improved emission reduction technologies become available, construction mitigation measures will be updated and implemented as specific control measures are developed and projects proposed.

REMAINING CONSTRUCTION AIR QUALITY IMPACTS: The air quality analysis concluded that significant adverse construction air quality impacts could be created by the proposed project because future construction inventories for CO and PM10 emissions indicate these pollutants would exceed the SCAQMD's applicable significance thresholds of 550 and 150 pounds per day, respectively. Since it is expected that construction activities to implement 2012 AQMP control measures would contribute to these exceedances, construction air quality impacts were concluded to be significant. In spite of implementing the above mitigation measures, construction CO and PM10 air quality impacts would likely remain significant.

4.2.6.2 Criteria Pollutants - Operational Activities

4.2.6.2.1 Secondary Impacts from Increased Electricity Demand

PROJECT-SPECIFIC IMPACTS Electricity is often used as the power source to operate various components of add-on control equipment, such as electrostatic precipitators, ventilation systems, fan motors, vapor recovery systems, etc. Increased demand for electrical energy may require generation of additional electricity, which in turn could result in increased indirect emissions of criteria pollutants in the district and in other portions of California. The stationary source measures that may result in increased demand for electrical energy due to operation of add-on control equipment are included in Table 4.2-1.

Control Measure BCM-03 calls for emission reductions from PM control devices (e.g., electrostatic precipitators (ESP)) for under-fired charbroiler restaurant operations, which could increase electricity demand. Other control measures that could result in an increase in electricity include measures that would require add-on controls or retrofit and replacement of equipment, including CMB-01, IND-01, INC-01, FUG-01, and MCS-01. The required emissions reduction may be achieved through various types of add-on control equipment such as selective catalytic reduction (SCR) technology, PM filters, refrigerated condensers, liquid scrubbers, and positive displacement pumps. Each of the possible control types may have potential adverse energy impacts because the control technology uses electricity. The analysis of the effect of energy resources and electricity demand due to implementation of the 2012 AQMP can be found in Subchapter 4.3 of this Final Program EIR.

Several of the control measures would require support facilities and potentially increased use of electricity for on-road vehicles and off-road vehicles (e.g., ONRD-01, ONRD-02, ONRD-03, ONRD-05, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06). An increase in electric vehicles would require the generation of additional electricity in the district and other areas of California. In addition, shore-side electricity may be required associated with "cold ironing" of marine vessels (e.g., use of shore-side electricity while at berth, instead of use of diesel-fired auxiliary engines). As detailed in Subsection 4.3 of this Final Program EIR, the potential increase in the amount of electricity is expected to be 1,691.2 gigawatt-hours (GWh). The criteria pollutant emissions associated with the increase in energy demand is shown in Table 4.2-5 for the control measures which can be quantified.

TABLE 4.2-5

Estimated Criteria Pollutant Emissions from Increased Electricity Demand

	ESTIMATED EMISSIONS INCREASE (lbs/day)[(a)]					
CONTROL MEASURE	**VOC**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
ONRD-01	0.71	6.9	2.1	0.24	0.83	0.82
ONRD-02	1.4	14	4.2	0.48	1.7	1.6
ONRD-03	1.5	15	4.5	0.51	1.8	1.8
ONRD-05	0.91	8.9	2.7	0.31	1.1	1.1
ADV-01	10	101	31	3.5	12	12
ADV-02	16	158	48	5.5	19	19
Total Emissions Increase	31	303	92	10	36.	36

(a) The emission estimates are ratioed from the 2008 inventory emissions reported for Electric Utilities and Cogeneration from Appendix III of the 2012 AQMP (SCAQMD, 2012).

Two of the on-road control measures, ONRD-01 and ONRD-02, target emission reductions from transportation measures that would accelerate the penetration and deployment of partial zero-emission vehicles in the light- and medium-duty vehicles categories. One on-road control measure, ONRD-03, targets early deployment of partial zero-emission and zero-emission light- and medium-heavy duty vehicle. One on-road control measure, ONRD-05, seeks emission reductions at near-dock railyards through the deployment of zero-emission heavy-duty vehicles. All four of these control measures are expected to increase the use of electric and advanced hybrid electric vehicles, which would increase the demand for electricity and result in the increase in indirect emissions associated with electricity production. The amount of electricity generated is described in the energy impact Subchapter 4.3 of this Final Program EIR.

Electrification of motor vehicles and other commercial and industrial equipment would greatly reduce fossil fuel usage in the district. At that time, there may be an increase in emissions due to increased electric power generation due to increased demand. Although the control measures include projections regarding the penetration rate of electric vehicles, the actual number of electric vehicles is unknown and would need to be calculated during any rule development for these control measures. An incremental increase in electricity demand is not expected to create significant adverse air quality impacts compared to emission reductions from mobile and stationary sources. However, if electricity demand exceeds available power, additional sources of electricity would be required. Additional power plants would be required to supply the projected electricity due to general population growth, both in California and outside of California. Currently, there are a number of power plant projects planned in southern California to meet future needs. Relative to the existing electricity use and the projected future peak electricity demand, implementation of all the control measures is expected to result in an overall worst-case increase from the year 2008 baseline of approximately 1.5 percent (see Subsection 4.3 of this Final Program EIR).

Electricity generation within the district is subject to applicable SCAQMD rules such as Rule 1134 – Emissions Oxides of Nitrogen from Stationary Gas Turbines, Rule 1135 – Emissions of Oxides of Nitrogen from Stationary Gas Turbines, and Regulation XX – RECLAIM. These rules and regulations regulate NOx emissions (the primary pollutant of concern from natural gas combustion to generate electricity) from existing power generating equipment. Although emissions from electric utilities in the district are capped under the RECLAIM program (and under Rule 1135), any new power generating facilities in the district to accommodate increased electricity demand would be subject to SCAQMD Regulation XIII – New Source Review, or Rule 2005 which requires installation of BACT, air quality modeling would be required to demonstrate that new emissions would not result in significant ambient air quality impacts (so there would be no localized impacts), and emission offsets (through either emission reduction credits or RECLAIM trading credits) before permits could be issued emissions offsets, which for NOx emissions, for example, would be at a ratio of 1.2 to 1.0, or 1.2 pounds of emission reduction credits required for every new pound of NOx emitted from the power generating source or a ratio of 1.0 to 1.0 for RECLAIM sources. Any new power generating projects would be incorporated into the emission inventories used in future AQMPs and additional control measures would be identified if necessary and feasible. While the control measures may cause an increase in NOx emissions from power plants, overall the 2012 AQMP is expected to achieve net NOx emission reductions to maintain attainment of all NO2 ambient air quality standards and continue making expeditious progress in achieving the federal one-hour and eight-hour standards. Further, emissions from the combustion of gasoline or diesel fuels are generally the emissions that would be reduced when electrification is proposed and replaced with emissions from the combustion of natural gas (as would generally occur from electricity generating facilities in the district). Emissions from diesel combustion (e.g., marine vessel engines) are orders of magnitude higher than emissions from the combustion of natural gas. So, overall emissions are expected to decrease. No significant adverse impacts to air quality are expected from control measures requiring increased demand for electricity.

There could be an increase in emissions from generators that may be used to charge batteries in remote locations where no grounded power source is available. Generators are regulated sources in the district. Existing SCAQMD regulations that apply to generators and emergency generators would apply to generators used to charge batteries. New generators would be subject to Regulation XIII or Rule 2005. Existing generators are subject to SCAQMD Rule 1110.2 – Emissions from Gaseous and Liquid Fueled Internal Combustion Engines. Rule 1110.2 does not establish a facility emission cap, but establishes a stringent NOx emission rate. Truly portable equipment may also be regulated under the state registration program, which establishes emission limitations on NOx, VOCs, and CO.

The emissions from electrical generation have been included in the emissions inventory prepared for the 2012 AQMP. Table 4.2-6 summarizes the emissions associated with electric generation in the key years 2104 and 2023.

TABLE 4.2-6

Annual Average Operational Emissions for Electric Generation in the District (tons/day)

Source Category	VOC	CO	NOx	SOx	PM10	PM2.5
2008 Emission Inventory						
Electric Utilities	1.0	9.9	2.7	0.33	1.2	1.2
Cogeneration	0.05	0.04	0.43	0.03	0.05	0.05
2008 Total	1.1	10	3.1	0.34	1.2	1.2
2014 Emission Inventory						
Electric Utilities	0.88	8.7	2.4	0.29	1.0	1.0
Cogeneration	0.05	0.39	0.43	0.03	0.05	0.05
2014 Total	0.93	9.1	2.8	0.32	1.1	1.1
Emission Increase (emissions in 2014 – emission in 2008)	-0.13	-0.87	-0.31	-0.03	-0.14	-0.13
Emissions Increase (lbs/day)	-260	-1,740	-620	-60	-280	-260
1.5% Emissions Increase from Control Measures (lbs/day)	31	303	92	10	36	36
Total Emissions Increase (lbs/day)	-229	-1,437	-528	-50	-244	-224

TABLE 4.2-6 (CONCLUDED)

Annual Average Operational Emissions for Electric Generation in the District (tons/day)

Source Category	VOC	CO	NOx	SOx	PM10	PM2.5
2023 Emissions Inventory						
Electric Utilities	0.86	8.5	2.3	0.28	1.0	1.0
Cogeneration	0.05	0.41	0.43	0.03	0.05	0.05
2023 Total	0.91	8.9	2.7	0.31	1.1	1.1
Emission Increase (emissions in 2023 – emission in 2008)	-0.15	-1.07	-0.40	-0.05	-0.17	-0.16
Emissions Increase (lbs/day)	-300	-2,140	-800	-100	-340	-320
1.5 % Emissions Increase from Control Measures (lbs/day)	31	303	92	10	36	35
Total Emissions Increase (lbs/day)	-269	-1,837	-708	-90	-304	-284

Source: SCAQMD, 2012
Note: Negative numbers represent emissions reductions.

The inventory prepared for the 2102 AQMP includes estimates for electric utilities and cogeneration facilities in key years 2014 and 2023. It is assumed that the emissions associated with electrical generation that are part of the 2012 AQMP control measures would contribute to the emission changes identified in the emission inventories. The inventory also accounts for growth in population. It has been estimated that implementation of all the control measures is expected to result in an overall increase in electricity in 2023 of approximately 1.5 percent, relative to the projected peak electricity demand in 2008. As shown in Table 4.2-6, the estimated VOC, CO, NOx, SOx, PM10, and PM2.5 emissions are expected to decline between 2014 and 2023.

Table 4.2-7 shows total emissions from 2012 AQMP. As shown in Table 4.2-7, overall, emissions from 2012 AQMP control measures are not expected to exceed the SCAQMD's daily regional significance thresholds and, ultimately, would provide an emission reduction benefit.

TABLE 4.2-7

Total Annual Average Operational Emissions from Implementation of the 2012 AQMP in the District (tons/day)

Source Category	VOC	CO	NOx	SOx	PM10	PM2.5
2008 Emission Inventory						
2008 Total	593	2,881	757	54	167	80
2014 Emission Inventory						
2014 Total	451	2095	502	19	155	70
Emissions Increase from Implementation of the 2012 AQMP	-142	-786	-256	-36	-12	-10
Emissions Increase from Implementation of the 2012 AQMP (lbs/day)	-283,260	-1,572,020	-511,180	-71,460	-23,780	-19,880
SCAQMD Significance Thresholds (lbs/day)	55	550	55	150	150	55
Significant?	NO	NO	NO	NO	NO	NO
2023 Emissions Inventory						
2023 Total	406	1,583	~~322~~ 328	18	164	71
Emissions Increase from Implementation of the 2012 AQMP	-187	-1,297	-~~435~~ 429	-36	-2.9	-9.1
Emissions Increase from Implementation of the 2012 AQMP (lbs/day)	-373,820	-2,594,860	~~-870,520~~ 850,000	-72,020	-5,780	-18,280
SCAQMD Significance Thresholds (lbs/day)	55	550	55	150	150	55
Significant?	NO	NO	NO	NO	NO	NO

Source: SCAQMD, 2012

Note: Negative numbers represent emissions reductions.

The SCAQMD does not regulate electricity generating facilities outside of the district so the rules and regulations discussed above do not apply to electricity generating facilities outside of the district. In 2010, about 71 percent of the electricity used in California was generated in-state and about 29 percent was imported (see Section 3.2.3). While these electricity generating facilities would not be subject to SCAQMD rules and regulations, they would be subject to the rules and regulations of the local air pollution control district and the U.S. EPA. These agencies also have established New Source Review regulations for new and modified facilities that generally require compliance with BACT or lowest achievable emission reduction technology. Most in-state electricity generating plants use natural gas, which provides a relatively clean source of fuel (as compared to coal- or diesel-fueled plants). The emissions from these power plants would also be controlled by local, state, and federal rules and regulations, minimizing overall air emissions. These rules and regulations may differ from the SCAQMD rules and regulations because the ambient air quality and emission.

Power plants in California provided approximately 71 percent of the total in-state electricity demand in 2010 of which 15 percent came from renewable sources such as biomass, geothermal, small hydro, solar, and wind, which are clean sources of energy. These sources of electricity generate little, if any, air emissions. Increased use of these and other clean technologies will continue to minimize emissions from the generation of electricity. State law requires increasing the use of renewable energy to 20 percent by 2017 (modified from 2010 as presented in the 2007 AQMP) and to 33 percent by 2020. Further, adopted state laws will prohibit using electricity produced by coal-fired plants.

PROJECT-SPECIFIC MITIGATION: To the extent that electricity demand from 2012 AQMP control measures, no significant secondary air quality impacts from increased electricity demand were identified so mitigation measures are not required.

REMAINING SECONDARY AIR QUALITY IMPACTS: The air quality analysis concluded that potential secondary air quality impacts from increased electricity demand would be less than significant, no mitigation measures were required, so secondary air quality impacts remain less than significant.

4.2.6.2.2 Secondary Impacts from Control of Stationary Sources

PROJECT-SPECIFIC IMPACTS: Emission reductions from the control of emissions at several stationary sources could result in secondary emissions.

Control Measure CMB-01 includes further NOx reduction such as reducing the NOx allocation for some NOx RECLAIM facilities. Under the RECLAIM regulations, operators of affected facilities are currently able to choose how to reduce NOx emissions. Options to further reduce NOx emissions could include addition of control equipment (e.g., SCR, low-NOx Burners, NOx reducing catalysts, oxy-fuel furnaces, and selective non-catalytic reduction) by focusing on periodic best available retrofit control technology (BARCT) evaluation.

While some control measures may cause small increases in NOx emissions, the 2012 AQMP would achieve enough NOx reductions overall to continue making expeditious progress in attaining the federal one-hour and eight-hour ambient air quality standards for ozone. Selective catalytic reduction (SCR) has been used to control NOx emissions from stationary sources for many years. Like an oxidation catalyst, SCR promotes chemical reactions in the presence of a catalyst. However, unlike oxidation catalysts, a reductant (e.g., ammonia) is added to the exhaust stream in order to convert NOx to elemental nitrogen and oxygen in an oxidizing environment. As exhaust gases along with the reductant pass over the catalyst, 75 to 90 percent of NOx emissions, 50 to 90 percent of the VOC emissions, and 30 to 50 percent of the PM10 emissions are reduced.

There is the potential for secondary particulate formation from ammonia slip in sources that use SCR for control. Anticipating that SCR units would become widespread to comply with the NOx control rules under development over 20 years ago, the CEQA documents prepared by the SCAQMD for these new NOx control rules evaluated the potential for secondary PM10 formation from SCR systems. As part of analyses prepared for the EIRs for the NOx control rules, the SCAQMD conducted an extensive literature review and contacted a number of SCR manufacturers and vendors. The results of this data collection effort indicated that ammonia slip depends on a variety of factors including space velocity, ammonia to NOx molar ratio, temperature, and NOx inlet concentration.

The analysis also indicated that, SCRs in use at that time typically had an ammonia slip level ranging from approximately ten to 20 ppm. Ammonia slip levels in this range were the result of the following factors. First, to ensure maximum NOx reduction efficiency, SCR operators at that time typically injected excess ammonia (e.g., a higher ammonia to NOx molar ratio, into the flue gas to ensure achieving the appropriate NOx reduction reaction). The excess ammonia that does not react with the NOx passes or "slips" through the reactor vessel and is released into the atmosphere. With a decline in catalyst activity, to achieve the same NOx reductions, it often became necessary to increase the amount of ammonia injected into the flue gas, which in turn increases ammonia slip. Similarly, the analysis found that one of the main operational problems that contributed to ammonia slip was the uneven distribution of NOx in the duct ahead of the catalyst, creating a non-uniform mixture of ammonia and NOx over the entire cross-section of the duct and resulting in high levels of ammonia slip. Finally, the early NOx control EIRs prepared by the SCAQMD indicated that formation of ammonium nitrate (NH_4NO_3) could be a problem if temperatures were less than 169 ^oC.

The SCAQMD's early NOx control EIRs concluded that ammonium nitrate (NH_4NO_3) formation would not be a significant adverse air quality impact if ammonia slip is reduced to ten ppm or less by maintaining uniform ammonia injection. Ensuring adequate mixing of ammonia in the flue gas can alleviate this problem. Ammonia slip can also be reduced by maintaining the proper ammonia to NOx molar ratio, decreasing the exhaust gas flow rate, maintaining consistent exhaust velocity, and maintaining an optimal temperature regime.

The SCR technology has progressed such that ammonia slip can now be limited to five ppm. For example, SCR vendors have developed better injection systems that result in a more even distribution of NOx ahead of the catalyst so that the potential for ammonia slip has been reduced. Similarly, ammonia injection rates are more precisely controlled by model control logic units that are a combination of feed-back control and feed forward control using a proportional/integral controller that sets flow rates by predicting SCR outlet ammonia concentrations and calibrating them to a set reference value.

Subsequent to the preparation of the early EIRs for the SCAQMD's NOx control rules, catalyst research has focused on reducing SO_2 oxidation. Even over 20 years ago, SCR vendors reported that SO_2 oxidation of their catalyst was less than one to four percent (SCAQMD, 1990). SO_2 to SO_3 conversion has been reduced by decreasing the amount of active ingredient (typically vanadium pentoxide), adding an active element as a promoter and improving the dispersion of active elements. SCR vendors have indicated that problems with ammonium particulates tend to be minimal if the amount of ammonia slip in the flue gas averages less than five to ten ppm. Particulate problems with ammonium bisulfate (NH_4HSO_4), and ammonium sulfate ($(NH_4)_2SO_4$), can be alleviated by reducing ammonia slip (SCAQMD, 1990).

In summary, in the early EIRs for the SCAQMD's NOx control rules (e.g., the EIR for Rule 1135), SCAQMD staff determined that the impacts related to secondary PM10 formation would be less than significant if ammonia slip were limited to five to ten ppm because ammonia would then be a limiting factor in producing secondary particulates. Based on substantial improvements in the SCR control technology, as well as improvements in ammonia monitoring equipment, minimizing ammonia slip to five ppm or less is feasible and is now a standard design parameter for SCR and catalyst manufacturers and secondary particulate emissions from SCR units has ceased to be a potentially significant adverse air quality impact with the standard imposition of ammonia limits less than ten ppm.

The SCAQMD has permitted numerous SCR systems within the district since the early 1990's and, therefore, has a longstanding practice of imposing permit conditions limiting ammonia slip. The current SCAQMD limit for ammonia slip for new, modified, or relocated equipment is five ppm, thus, minimizing the potential formation of secondary particulates, ammonium nitrate, in particular.

Based on the above, no new or substantially more severe significant air quality impacts related to ammonia emissions and secondary PM10 formation from the increased use of SCR systems is expected. The five ppm ammonia limit would be included as an enforceable permit condition on the SCAQMD permit to construct/operate. Operators would be required to monitor ammonia slip by conducting an annual source test and maintain a continuous monitoring system to accurately indicate the ammonia-to-emitted-NOx mole ratio at the inlet of the SCR.

Control Measure FUG-01 may result in an increase in natural gas used to combust VOC emissions from vacuum trucks used to remove materials from storage tanks, vessels, sumps, boxes and pipelines. VOC emissions may be controlled by using carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers, liquid scrubbers and positive displacement (PD) pumps. SCAQMD staff estimates that 27 million cubic feet per year of natural gas (thermal oxidizers) and 2,100 gallons of gasoline (internal combustion engines)may be used per year to combust fugitive VOCs from storage tanks, vessels, sumps, boxes and pipelines pulled by a vacuum truck. Criteria emissions from FUG -01 are included in Table 4.2-7.

Control Measure FUG-02 would require emission reductions from fugitive emissions associated with the transfer and dispensing of liquefied petroleum gas (LPG). FUG-02 would be implemented in two phases: Phase I, which was implemented with the adoption of Rule 1177 on June 1, 2012 and required the use of low emission fixed liquid level gauges (FLLGs) and low emission connectors for transfer and dispensing; and Phase II, which would expand the applicability of Rule 1177 to include LPG transfer and dispensing at other facilities, including currently exempted facilities. Implementation of Phase I of Rule 1177 is expected to result in a reduction of VOC emissions of 6.1 tons per day with an additional one to two tons per day with the implementation of Phase II. No significant secondary air quality impacts associated with VOC reductions from Control Measure FUG-02 are expected.

Control Measure BCM-03 would reduce PM2.5 emissions from under-fired charbroilers. Under-fired charbroilers are comprised of three main components: a heating source, a high temperature radiant surface, and a slotted grill. The grill holds the meat or other food while exposing it to the radiant heat. PM and VOC emissions occur when grease from the meat falls onto the high temperature radiant surface. Most under-fired charbroilers burn natural gas; however, solid fuels, such as charcoal or wood with or without the addition of ceramic stones, are sometimes used. This category includes: broilers, grill charbroilers, flamebroilers, and direct-fired barbecues. Potential control technologies that could generate secondary air quality impacts include the following.

- HEPA filters trap small particles by one of three mechanisms: interception (particles come within one radius of a fiber and adhere to it); impaction (particles are forced to embed in one of the fibers), or diffusion (an enhancing mechanism resulting from gas molecules collision with small particles which slows their flow). Diffusion is the predominate mechanism below the 0.1 (micrometer) μm diameter particle size. Impaction and interception predominate above 0.4 μm. In the 0.3 μm range, diffusion and interception predominate. Currently, there are no HEPAs with SCAQMD permits to control emissions from charbroilers in the Basin.

- Wet scrubbers rely on a finely atomized stream of liquid to capture particulate and gaseous pollutants from an exhaust stream, such as from a restaurant charbroiler. Heat and mass transfer are accomplished by direct contact of the exhaust gas with finely atomized droplets of the scrubbing liquid. The gas stream is cooled and moistened as the scrubbing liquid evaporates. PM removal efficiencies of 90 percent or higher have been achieved in service depending on particle size, load, flows and pressure drop. Presently, there are nine wet scrubbers permitted at restaurants located in the Basin.

- ESPs rely on imparting a 220-volt AC power supply transformed to high voltage direct current (DC) charge to the particulate materials while simultaneously ionizing the carrier gas, producing an electric corona. The particles, either negatively or positively charged, are attracted to the ESP electrode of the opposite charge and finally removed from the electrodes by rapping or washing the electrodes. An after filter is sometimes used to provide back pressure and ensure good gas distribution in the ESP. Collection efficiencies exceeding 90 percent are common in many applications. At present, there are 27 ESPs permitted and operating at restaurants located in the Basin.

- Regenerative thermal oxidizers (RTOs) consist of a combustion chamber located adjacent to several energy recovery chambers. The VOC-laden air enters an inlet header and is directed to one of the energy recovery chambers through the inlet control valve. The air passes through the heat exchange media, adsorbing heat from the media. It then enters the combustion chamber at a temperature close to the oxidation temperature. The oxidation process is completed in the combustion chamber. At least one chamber is always on inlet mode and another on outlet mode to allow the RTO to continuously process a VOC-laden air stream.

Based on the above information, installation of various types of control devices to comply with the requirements of 2012 AQMP control measure. HEPA filter and ESP technologies may result in increased demand for electricity, resulting in secondary emissions from electricity production. RTOs could increase demand for natural gas, producing secondary combustion emissions.

Control Measure MCS-01 would require the SCAQMD to adopt and implement new retrofit technology control standards (BARCT) as new BARCT standards become available. Although it is currently unknown what the new BARCT standards would be, to the extent that they require installation of control technologies, potential secondary air quality impacts could be generated. For example, potential construction air quality impacts from construction activities to install future BARCT equipment, from on-road vehicles (e.g., worker commute trips, haul truck delivery trips, etc.) and off-road construction equipment could be generated. Similarly, to the extent that BARCT technologies operate using electricity to run the equipment or natural gas combustion as part of the control process, secondary emissions from electricity generation or natural gas combustion could be generated. Although SCR is BARCT for controlling NOx emissions from a variety of combustion sources, if it is determined to be BARCT for other types of combustion sources ammonia slip emissions could be generated. However, since the source of emissions and the BARCT is unknown at this time, SCAQMD staff is unable to estimate secondary emission from Control Measure MCS-01.

Control Measure INC-01 may result in the replacement of existing combustion equipment with more efficient or zero emission technologies. INC-01 may also result in the installation of control technologies or the use of alternative fuels. Zero emission technologies are likely to be powered by electricity. Control technology may include diesel particulate filters and NOx reduction catalysts. However, since the source of emissions, control technology and energy requirements are unknown at this time; SCAQMD staff is unable to estimate secondary emission from Control Measure INC-01.

PROJECT-SPECIFIC MITIGATION: Based on the above information, potential secondary air quality impacts from control technologies associated with stationary sources were concluded to be less than significant so no mitigation measures are required.

REMAINING SECONDARY AIR QUALITY IMPACTS: The air quality analysis concluded that potential secondary air quality impacts from control technologies associated with stationary sources would be less than significant, no mitigation measures were required, so secondary air quality impacts remain less than significant.

4.2.6.2.3 Secondary Impacts from Change in Use of Lower VOC Materials

PROJECT-SPECIFIC IMPACTS: Several control measures are aimed at reducing VOC emissions by reformulating certain products including architectural coatings (CTS-01); miscellaneous coating adhesives, solvents, and lubricants (CTS-02); and, mold release products (CTS-03). An additional control measure, CTS-04, would further reduce VOC emissions by revising or eliminating the exemption for low vapor pressure solvents in consumer products. Consumer products include, but are not limited to: detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products such as antiperspirants and hairsprays; home, lawn, and garden products; disinfectants; sanitizers; automotive specialty products; and, aerosol paints.

The analysis of secondary emissions from changes in use of lower VOC materials is focused on emissions from reducing the VOC from reformulated coatings (such as flat, non-flat, and primer sealer undercoaters (PSU)). To obtain further VOC emission reductions from these products it is expected the products would be reformulated with water-based or exempt compound formulations. The following subsections identify potential secondary air quality impacts from lowering the VOC content limit further. Although the following discussion focused primarily on coatings, some of its topics (e.g., substitution, more reactivity, and low vapor pressure), could apply to other types of consumer products.

Control Measure CTS-01 is expected to lower the VOC content from 50 grams per liter to 25 grams per liter. It is expected that this reduction would not substantially change the primary components of the coatings. As a result, the issues discussed below may no longer be applicable. Control Measures CTS-02 and CTS-03 are expected to lower the VOC content in miscellaneous coatings, adhesives, solvents, and lubricants as well as mold release products by requiring the lowering the VOC-content of the products. Control Measure CTRS-04 is expected to reduce VOC emissions from consumer products by revising the exemptions for the use of low vapor pressure VOC solvents. The following issues have raised with regard to reformulated coatings in both the 2003 and 2007 AQMPs.

The potential secondary air quality impacts associated with reformulation of coatings has been extensively evaluated in both the 2003 and 2007 AQMPs, as well as in a number of amendments to existing coatings rules. At the time, reformulations were shifting coatings from primarily solvent-based to water-based and exempt-solvent formulations. Secondary air quality impacts discussed previously in the 2007 AQMP were relative to more thickness of the coating, illegal thinning to reduce the viscosity of the reformulated coatings, more priming, more topcoats, more touch-ups and repair work, more frequent recoating, substitution, more reactivity, and synergistic effects of the eight issues. Each issue is summarized in the following bullet points along with the associated conclusions reached in the 2007 AQMP for each issue:

- **More thickness -** reformulated compliant water- and solvent-borne coatings are very viscous (e.g., are formulated using a high-solids content) and, therefore, are difficult to handle during application, tending to produce a thick film when applied directly from the can. A thicker film indicates that a smaller surface area is covered with a given amount of material, thereby increasing VOC emissions per unit of area covered.

  Response - Compliant low-VOC coatings are not necessarily formulated with higher solids content than conventional coatings. A low-VOC coating is expected to cover the same or larger surface area than a high-VOC coating. Further, there is no evidence that there is an inverse correlation between solids content and coverage area (SCAQMD, 2007).

- **Illegal thinning -** thinning occurs in the field in excess of what is allowed by the SCAQMD rule limits. It is asserted that, because reformulated compliant water- and solvent-borne coatings are more viscous (e.g., high-solids content), painters have to adjust the properties of the coatings to make them easier to handle and apply. In particular for solvent-borne coatings this adjustment consists of thinning the coating as supplied by the manufacturer by adding solvent to reduce its viscosity. The added solvent increases VOC emissions back to or sometimes above the level of older formulations.

Response - SCAQMD staff conducted extensive research prior to 1998 to determine whether or not thinning of materials beyond the allowable levels occurred in the field. SCAQMD staff conducted unannounced site visits to evaluate contractor practices, collected samples as applied and supplied from contractors, analyzed paint samples from retail outlets. No thinning beyond SCAQMD rule limits was identified. In addition, the CARB 2005 Architectural Coating Survey provided results of compliance with the CARB Suggested Control Measure for Architectural Coatings. In most cases the percent of complying market share from the 2005 survey improved or was approximately the same as the 2001 CARB survey. Therefore, the 2007 Final Program EIR concluded that widespread thinning does not happen often; when it does occur, it is unlikely to occur at a level that would lead to a substantial emissions increase when compared to emissions from higher VOC coatings (SCAQMD, 2007).

Currently, the majority of the architectural coatings currently available in the marketplace are waterborne. Thinning is not an issue for waterborne coatings as thinning with water would not increase the VOC content of those coatings. Of the total coatings sold in 2008, only seven percent of were solvent-based which equates to approximately three million gallons. Architectural Coatings sold in small containers with a VOC content greater than the VOC limits for those categories represented 15 percent of the total volume or slightly more than 0.4 million gallons. The proposed elimination of the small container exemption would therefore result in more waterborne coatings, further lessening the potential adverse impact of thinning with solvent. In addition, large containers would already comply with applicable VOC content limits so there would be no widespread thinning of small container coatings to meet small container needs. For the years between 2009 and 2011, the overall volume of solvent-based coatings was reduced by an additional 22 percent, and the potential for thinning was reduced by an equivalent amount. Further, adoption and implementation of Rule 1143 – Consumer Paint Thinner and Multi-Purpose Solvents, requires the use of paint thinners that have a VOC content of less than or equal to 25 grams per liter, resulting in paint thinners that are based on exempt solvents, further reducing the impacts from thinning of solvent-based architectural coatings.

- **More priming -** reformulated compliant low-VOC water- and solvent-borne topcoats do not adhere as well as higher-VOC solvent-based topcoats to unprimed substrates. Therefore, the substrates must be primed with typical solvent-based primers to enhance the adherence quality. Industry representatives have testified that the use of water-borne compliant topcoats could require more priming to promote adhesion. Additionally, it has been asserted that water-borne sealers do not penetrate and seal porous substrates like wood, as well as traditional solvent-borne sealers. This allegedly results in three or four coats of the sealer per application compared to one coat for a solvent-based sealer would be necessary, resulting in an overall increase in VOC emissions for the coating system.

Response - SCAQMD staff evaluated surface preparation in coating product data sheets and recent studies on the topic. It was determined that low-VOC coatings do not require substantial different surface preparation than conventional coatings. Both low-VOC and conventional coatings for both architectural and industrial maintenance applications were demonstrated to have the ability to adhere to a variety of surfaces. Based on the coating sheets, the material needed and the tie necessary to prepare a surface for coating was approximately equivalent for low-VOC and conventional coatings (SCAQMD, 2007).

In addition, a recent trend for coating manufacturers is to produce ultra low-VOC coatings that are primer and topcoat in one, hence eliminating an entire step in the coating process. Most major coatings manufacturers now offer such products, some of which are as low as 5.0 grams per liter. Therefore, any impacts from priming have been significantly reduced.

- **More topcoats -** reformulated compliant water- and low-VOC solvent-borne topcoats may not cover, build, or flow-and-level as well as the solvent-borne formulations. Therefore, more coats are necessary to achieve equivalent cover and coating build-up.

  Response - Based on information in product data sheets, SCAQMD staff found that the average drying time for lower-VOC coatings did increase compared to conventional coatings; however, with the development of non-volatile, reactive diluents combined with hypersurfactants, performance of the lower-VOC coatings equaled or outperformed traditional, solvent containing coatings. Resistance to chemicals, corrosion, chalk, impact and abrasion, adhesion and the ability to retain gloss and color was found to be similar in lower-VOC and conventional coatings. Coating manufacturer data indicated that low-VOC and conventional coatings for both architectural and industrial maintenance applications are durable and long lasting. More frequent recoating was not found for low-VOC coatings when compared to conventional coatings (SCAQMD, 2007).

- **More touch-ups and repair work -** reformulated compliant water- and low-VOC solvent-borne formulations dry slowly, and are susceptible to damage such as sagging, wrinkling, alligatoring, or becoming scraped and scratched. Claims have been made that the high-solids solvent-borne alkyd enamels tend to yellow in dark areas, and that water-borne coatings tend to blister or peel, and also result in severe blocking problems. All of these problems were reported to require additional coatings for repair and touch-up.

  Based on SCAQMD staff's evaluation of the durability characteristics information contained in the coating product data sheets, low-VOC coatings and conventional coatings have comparable durability characteristics. These conclusions are supported by the UMR, NTS and other coating studies. As a result, it is not anticipated that more touch up and repair work will need to be conducted with usage of low-VOC coatings.

- **More frequent recoating -** the durability of the reformulated compliant water- and low-VOC solvent-based coatings is inferior to the durability of the traditional solvent-borne coatings. Durability problems include cracking, peeling, excessive chalking, and color fading, which all typically result in more frequent recoating. As a result, they claim more frequent recoating would be necessary resulting in greater total emissions than would be the case for conventional coatings.

  Response - The latest data from coating manufacturers obtained by SCAQMD staff indicate that the new generation of waterborne coatings is performing as well if not better than their solvent-based counterparts. These commercialized products are formulated with better performing raw materials, including superior resin chemistry and higher performing pigments, resulting in better hiding and coverage and overall durability, therefore, a reduction in coating usage is expected.

- **Substitution -** reformulated compliant water- and low-VOC solvent-borne coatings are inferior in durability and are more difficult to apply, so consumers and contractors will substitute better performing high VOC coatings in other categories for use in categories with low compliance limits. An example of this substitution could be the use of a higher VOC product (e.g., clear wood coatings) currently sold under the small container exemption, which has a higher VOC content limit requirement, in place of a lower-VOC clear wood coatings.

  Response - SCAQMD staff determined that substitution would not occur because based on product data sheets and studies, there are, generally a substantial number of low-VOC coatings in a wide variety of coating categories that are currently available; and CARB and SCAQMD rules prohibit the application of certain coatings in specific settings.

  In the rare event that substitution does occur, it is expected that future coatings would still achieve overall VOC emission reductions. Substitution would only result in lesser emission reductions than expected, it would not increase emissions compared to the existing setting. Consequently, it is not expected that control measures requiring a lower overall VOC content of coatings will result in significant adverse air quality impacts from the substitution of low-VOC coatings with higher-VOC coatings (SCAQMD, 2007).

- **Reactivity -** reformulated compliant low-VOC water- and solvent-borne coatings contain solvents that are more reactive than the solvents used in conventional coating formulations. Water-borne coatings perform best under warm, dry weather conditions, and are typically recommended for use between May and October. Since ozone formation is also dependent on the meteorological conditions, use of waterborne coatings during this period increases the formation of ozone.

  Response - SCAQMD staff has continued to monitor all reactivity-related research since the 2007 AQMP. However, based on the latest research and analysis, as well as the recommendations of the research, staff supports the continuation of a mass-based ozone control strategy, with future consideration for a reactivity-based approach.

- **Synergetic Effects of the Eight Issues –** Individually each of the eight issues does not result in a significant adverse air quality impact; therefore, the synergistic effect of all eight issues were determined not to result in a significant air quality impact. The Final Program EIR for the 2007 AQMP~~D~~ stated that even if it is assumed that some of the alleged activities do occur, the net overall effect of reducing the VOC content of coatings and other consumer products is expected to be a reduction in VOC emissions.

Based on the preceding analysis of potential air quality impacts from implementing future coatings rules, it is concluded that the overall air quality effects would be a VOC emission reduction and beneficial to air quality in the district.

PROJECT-SPECIFIC MITIGATION: Potential secondary adverse air quality impacts from future coating or consumer product regulations were evaluated and it was concluded that impacts would be less than significant, so no mitigation measures are required.

REMAINING SECONDARY AIR QUALITY IMPACTS: The air quality analysis concluded that potential secondary air quality impacts from future reformulated coatings and solvent products would be less than significant, no mitigation measures were required, so secondary air quality impacts remain less than significant.

4.2.6.2.4 Secondary Impacts from Mobile Sources

PROJECT-SPECIFIC IMPACTS: Three control measures, ONRD-01, ONRD-02, and ONRD-03, are aimed at reducing emissions from mobile sources by accelerating the penetration of partial zero-emission and zero emission vehicles. These control measures do not directly generate secondary air quality impacts, but generate indirect air quality impacts from the generation of electricity required to operate the additional partial zero-emission and zero emission vehicles. The secondary air quality impacts associated with the increase in electrical demand have been discussed in the beginning of this subsection under "Secondary Impacts for Increased Electricity Demand".

Control Measure ONRD-04 accelerates the replacement of heavy duty diesel vehicles (26,001 pounds and greater gross vehicle weight) with newer, lower-emissions vehicles. The early replacement of these vehicles could potentially increase the number of vehicles being scrapped. Scrapping activities generate secondary air quality impacts from the shredding of the vehicle and the electricity to perform the scrapping. During the Rule 1610 rulemaking, emissions associated with vehicle scrapping were estimated to be 0.088 pound of PM10 emissions per vehicle scrapped (SCAQMD, 1992). The actual number of vehicles scrapped would depend on the actual number of vehicles participating in the program. Emissions impacts would also depend on the number of vehicles scrapped instead of relocated outside the district, the number of vehicles scrapped at facilities within the district, and the available capacity within the district to scrap the vehicle at the time it is retired. Based on the number of factors that affect the quantification of the secondary emissions, quantification of the secondary air quality impacts would be speculative. However, the quantity of PM10 generated per vehicle scrapped is approximately the same as a diesel truck driving 50 miles.

Control Measure ONRD-05 would accelerate the replacement of up to 1,000 older heavy-duty vehicles with zero-emission vehicles or zero-emissions container movement systems. This control measure does not directly generate secondary air quality impacts, but generates indirect air quality impacts from the generation of electricity required to operate the additional partial zero-emission and zero emission vehicles. The secondary air quality impacts associated with the increase in electrical demand have been discussed in the beginning of this subsection under “Secondary Impacts for Increased Electricity Demand.” As with ONRD-04, retirement of the older heavy-duty vehicles could potentially increase the vehicle scrapping and the same uncertainties as to the disposition of the retired vehicle would occur. A conservative estimate of the emissions associated with retirement of 1,000 vehicles would be if all 1,000 were scrapped in a single day within the district (e.g., 0.088 pound of PM10 per vehicle x 1,000 vehicles = 88 pound of PM10, which is less than the PM10 significance threshold of 150 pounds per day). Using the CEIDARS profile 900 ratio of 0.6 pound of PM2.5 per pound of PM10, results in 52.8 pounds per day of PM2.5 emissions, which is below the PM2.5 significance threshold of 55 pounds per day. Therefore, secondary air quality impacts associated with the vehicle scrapping would be less than significant.

Control Measure OFFRD-01 would accelerate the replacement or retrofit of approximately 1,200 pieces of older construction equipment. As with ONRD-04, retirement of the older heavy-duty vehicles could potentially increase the vehicle scrapping and the same uncertainties as to the disposition of the retired vehicle would occur. However, construction equipment is typically refurbished and a new engine installed, so no scrapping of construction equipment is expected. Therefore, quantification of the secondary air quality impacts would be speculative. Retrofit methods could include add-on devices such as, particulate filters and SCRs.

Add-on devices, such as particulate filters have an increase in fuel use, typically estimated at less than one percent, associated with the decrease in fuel economy associated with the type of device. Therefore, there is a potential for an increase in emissions from the increase in fuel use. It is not known how much construction equipment will be retrofitted with particulate filters versus replaced. Therefore, quantification of the secondary air quality impacts would be speculative.

In the case of exhaust pollutants, Manufacturers of Emission Controls Association (MECA) reports that the use of oxidization catalysts to reduce PM10 emissions from diesel-fueled vehicles should not increase other exhaust pollutants. In fact, combining an oxidation catalyst with engine management techniques can be used to reduce NOx emissions from diesel engines. This is achieved by adjusting the engine for low NOx emissions, which is typically accompanied by increased CO, VOC, PM10, and PM2.5 emissions. An oxidation catalyst can be added to offset these increases, thereby lowering the exhaust levels for all of the pollutants. Often, the increases in CO, VOCs, and PM10 can be reduced to levels lower than otherwise could be achieved. In fact, a system which uses an oxidation catalyst combined with proprietary ceramic engine coatings and injection timing retard can achieve significant NOx reductions (e.g., greater than 40 percent) while maintaining low PM10 and PM2.5 emissions (MECA, 1999).

In the case of the use of SCRs, potential adverse air quality impacts associated with the use of SCRs in diesel-fueled vehicles could occur if this technology resulted in the increase of other exhaust pollutants at the expense of reducing PM10 and PM2.5 or a reduction in fuel economy. However, applying SCR to diesel-powered vehicles provides simultaneous reductions of NOx, PM10, PM2.5, and VOC emissions.

Like an oxidation catalyst, SCR promotes chemical reactions in the presence of a catalyst. However, unlike oxidation catalysts, a reductant is added to the exhaust stream in order to convert NOx to elemental nitrogen and oxygen in an oxidizing environment. The reductant can be ammonia but in mobile source applications, urea is normally preferred. As exhaust gases along with the reductant pass over the catalyst, 75 to 90 percent of NOx emissions, 50 to 90 percent of the VOC emissions, and 30 to 50 percent of the PM10 and PM2.5 emissions are reduced. SCR also reduces the characteristic odor produced by a diesel engine and the diesel smoke.

In the case of exhaust pollutants, the catalyst composition of SCR and its mode of operation are such that sulfates could form. However, with the use of ultra-low sulfur diesel fuel, which has been required for stationary and on-road applications since September 2006, sulfate formation is expected be negligible. In particular, even at temperatures in exceeding 500 degrees Centigrade, only five percent of the sulfur in the fuel would be converted to sulfate, which still allows for significant net PM10 and PM2.5 emission reductions. Applying SCR to diesel-powered vehicles also provides simultaneous reductions of NOx, PM10, PM2.5, and VOC emissions.

As to a reduction in fuel economy, because of the large NOx reductions afforded by SCR, it is possible that low NOx emissions can be achieved with an actual fuel economy benefit. Compared to internal engine NOx abatement strategies like exhaust gas recirculation and timing retard, SCR offers a fuel economy benefit in the range of three to 10 percent as a result of being able to optimize engine timing for fuel economy and relying on the SCR system to reduce NOx emissions. Therefore, no significant adverse air quality impacts were identified from the use of particulate filters or SCRs in conjunction with ultra-low sulfur diesel fuel to potentially comply with the applicable control measures.

Control Measures OFFRD-02 and OFFRD-03 would accelerate the replacement of 440 and 52 locomotive engines in freight and passenger service, respectively, or employ add-on devices to meet the lower emission standard, as such, the potential secondary air quality impacts from add-on devices. Therefore, the impacts of the replacement of locomotives and use of add-on devices are similar to those discussed for OFFRD-01. Similar to Control Measure OFFRD-01, locomotives are typically refurbished and a new engine installed so no scrapping of the locomotives are expected. Add-on devices, such as particulate filters have an increase in fuel use associated with the decrease in fuel economy associated with the type of add-on device, which is estimated to be less than one percent. Therefore, there is a potential for an increase in emissions from the increase in fuel use. However, the number of locomotives to be equipped with add-on devices versus replaced is not known. Therefore, quantification of the secondary air quality impacts would be speculative.

Control Measure OFFRD-04 would increase the amount of shorepower used for “cold ironing” by 25 percent. However, the demand for electricity varies based on the type of vessel. Therefore, the increase in electricity demand cannot be quantified. However, stationary power generating facilities can use alternative fuels such as natural gas, reducing emissions to low levels when compared to marine diesel. Therefore, the overall impact of using shorepower is expected to be a beneficial impact on air quality.

Control Measure ADV-07 would accelerate the replacement of aircraft engines with cleaner burning engines. Aircraft engines when retired from service are typically returned to the engine manufacturer for recycling. The early retirement and recycling of aircraft engines is not expected to generate secondary air quality impacts as no “shredding” like automobiles is necessary.

Control Measures OFFRD-02, OFFRD-03, ADV-04, ADV-05, ADV-06, and ADV-07 have the potential to use alternative fuels such as biodiesel, LNG, CNG, methanol, ethanol, and hydrogen. The availability of the producers of alternatives fuels to meet the increase in demand has the potential for an increase in air emissions associated with the increased production. Production of the alternative fuels such as LNG, CNG require little processing with less air emissions than the production of refined petroleum products such as gasoline, diesel, and jet fuel. While biodiesel, ethanol, and methanol production do require more processing than LNG and CNG, the production processes are less complicated than petroleum refining. Biodiesel and methanol are made from a catalytic chemical process similar to one or two processes in a typical refinery, which will have many units to produce refined products from crude oil. Ethanol is produced by fermentation. Biodiesel, methanol, and ethanol can be made from renewable sources such as vegetable oils, sugar cane, corn, and animal fats. Therefore, the production of alternative fuels typically produces less air emissions. The increase in air emissions from the increase in production of alternative fuels would be offset by the reduction in the production of petroleum fuels and the transport reduced of crude oil primarily from overseas, as diesel and gasoline demand decreases. Therefore, no increase air emissions associated with meeting the increase in demand for alternative fuels is expected and no significant secondary air quality impacts are expected.

Mobile source control measures are expected to result in changes in emissions related to mobile sources. The inventory prepared for the 2012 AQMP include emissions estimates associated with mobile sources discussed in this section, which are summarized in Table 4.2-7.

The inventory prepared for the 2012 AQMP includes estimates for on-road vehicles in 2008, 2014, and 2023. The inventory also accounts for growth in population that also includes growth in the number of mobile sources and an increase in the vehicle miles traveled. The estimated VOC, CO, NOx, SOx, PM10, and PM2.5 emissions associated with on-road mobile sources in the Basin are expected to be reduced between the 2008 and the 2014, and 2023 inventories. Therefore, the overall impact of mobile source control measures is expected to be a beneficial impact on air quality.

PROJECT-SPECIFIC MITIGATION: The overall impact of mobile source control measures is expected to be beneficial by providing large emission reductions from mobile sources. Therefore, air quality impacts associated with mobile source control measures are expected to be less than significant and no mitigation measures are required.

REMAINING SECONDARY AIR QUALITY IMPACTS: The air quality analysis concluded that potential secondary air quality impacts from mobile sources would be less than significant, no mitigation measures were required, so secondary air quality impacts remain less than significant.

Secondary Impacts from Miscellaneous Sources

PROJECT-SPECIFIC IMPACTS: Miscellaneous source control measures would regulate a variety of different types of emissions sources including both area and point sources. As a result, these control measures are expected to reduce VOC, criteria pollutant, and precursor emissions. The following control measures were identified to as having the potential to generate secondary air quality impacts.

TABLE 4.2-8

Annual Average Emissions for On-Road and Other Mobile Sources in the District (tons/day)

Source Category	VOC	CO	NOx	SOx	PM10	PM2.5
2008 Emission Inventory						
On-Road Motor Vehicles	209	1,966	462	2.1	32	19
Other Mobile Sources[a]	127	778	204	38	15	13
2008 Total	336	2,744	666	40	47	32
2014 Emission Inventory						
On-Road Motor Vehicles	117	1,165	272	2.1	25	12
Other Mobile Sources[a]	100	766	157	4.3	9.1	8.2
2014 Total	217	1,931	429	6.4	34	20
Emission Increase (emissions in 2014 – emission in 2008)	-119	-1,112	-236	-34.0	-12	-11
Emissions Increase (lbs/day)	-237,100	-2,224,060	-471,400	-67,980	-23,960	-22,880
Emission Increase from Control Measures Implementation	0	-4,000	0	0	0	0
Total Emissions Increase (lbs/day)	-237,100	-2,228,060	-471,400	-67,980	-23,960	-22,880
SCAQMD Significance Thresholds (lbs/day)	55	550	55	150	150	55
Significant?	NO	NO	NO	NO	NO	NO

TABLE 4.2-8 (CONCLUDED)

Annual Average Emissions for On-Road and Other Mobile Sources in the District (tons/day)

Source Category	VOC	CO	NOx	SOx	PM10	PM2.5
2023 Emissions Inventory						
On-Road Motor Vehicles	67	591	126	1.9	25	11
Other Mobile Sources[(a)]	85	826	130	5.8	7.4	6.6
2023 Total	153	1,417	255	7.7	32	18
Emission Increase (emissions in 2023 – emission in 2008)	-183	-1,326	-407	-33	-18	-15
Emissions Increase (lbs/day)	-366,260	-2,651,740	-814,360	-65,540	-35,600	-30,860
Emission Increase from Control Measures Implementation	-12,080	-52,620	0	0	0	0
Total Emissions Increase (lbs/day)	-378,340	-2,704,360	-814,360	-65,540	-35,600	-30,860
SCAQMD Significance Thresholds (lbs/day)	75	550	700	150	150	55
Significant?	NO	NO	NO	NO	NO	NO

Source: SCAQMD, 2012

Note: Negative numbers represent emissions reductions.

(a) Other Mobile Sources include aircraft, trains, ocean going vessels, commercial harbor crafts, recreational boats, off-road recreational vehicles, off-road equipment, farm equipment, and fuel storage and handling.

Control Measure MCS-02 would implement all feasible mitigation measures including: 1) requiring cover of chipped or ground greenwaste material as early as operationally possible; 2) requiring chipped or ground greenwaste material to remain covered until it is removed from the site within the required 48 hours pursuant to Rule 1133.1; 3) potential requiring season covering of chipped or ground greenwaste material during the summer months; and, 4) strengthening the reporting requirements in Rule 1133 Registration/Annual Update and Rule 1133.1 Recordkeeping. MCS-02 would be implemented in two phases: Phase 1 would be a re-evaluation of greenwaste material handling operations and inventory, and Phase 2 would be development of a rule to incorporate technically feasible and cost-effective best management practices (BMPs). MCS-02 is expected to reduce VOC emissions by 1.0 to 1.34 tons per day by 2014. However, to comply with covering requirements, early movement of the material may occur. While there is a potential for additional shipments to be made in lieu of covering, it is not expected to be a preferred, cost effective approach over covering of the material. Therefore, MCS-02 is expected not to generate additional vehicle trips that could create significant secondary air quality impacts.

Control Measure BCM-04 could require the application of sodium bisulfate (SBS), an acidifier, on livestock waste. SBS is being considered for use in animal housing areas where high concentrations of fresh manure are located. Research indicates best results with the use of SBS on "hot spots." SBS can also be applied to manure stock piles and at fence lines, and upon scraping manure to reduce ammonia spiking from the leftover remnants of manure and urine. SBS application may be required seasonally or episodically during times when high ambient PM2.5 levels are of concern. Additional delivery truck trips would be required to deliver SBS and SBS may be applied by hand or by tractor.

Control Measure FUG-03 may require additional vehicle trips to detect, verify or repair equipment with fugitive emissions at oil and gas production facilities, petroleum and chemical products processing, storage and transfer facilities, marine terminals, and other sources. Most of these facilities already have utilize self-inspection program for Inspection/Maintenance or leak detection and repair (LDAR) that involve individual screening of all of their piping components. The control measure would explore the use of new technologies to detect and verify VOC fugitive emissions in order to supplement existing programs in achieving additional emission reductions. Work practices for Rule 462 – Organic Liquid Loading, Rule 1142 - Marine Vessel Tank Operations and Rule - 1148.1 Oil Well Enhanced Drilling would be upgraded to a self-inspection program that requires repairs and maintenance to be documented with records and, where appropriate, reported. LDAR elements may also be added to Rules 1142 and 1148.1. LDAR elements may also be added to Rule 463 - Storage of Organic Liquids and 1178 - Further Reductions of VOC Emissions from Storage Tanks at Petroleum Facilities, Rule 1173 - Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum and Chemical Plants and Rule 1176 - Sumps and Wastewater Separators. Since control measure would enhance existing self-inspection programs, few additional vehicle trips associated with additional detection, verification and repairing of leaking are likely.

As indicated above, Control Measures MSC-02 and FUG-03 are not expected to generate a substantial number of new vehicle trips, if any, related to control requirements. Control Measure BCM-04 could require additional vehicle travel to deliver and apply acidifier. At this time, it is not known what controls may be applied, which facilities may require additional trips or how often these trips may be necessary. Therefore, no emission estimates could be prepared at this time. However, while these trips routine, they are not expected to be frequent; therefore, these emissions are not expected to be significant.

PROJECT-SPECIFIC MITIGATION: Overall, potential secondary air quality impacts from miscellaneous source control measures, in particular increased vehicle trips, are not expected to increase substantially. Therefore, potential secondary air quality impacts associated with miscellaneous source control measures are expected to would be less than significant and no mitigation measures are required.

REMAINING SECONDARY AIR QUALITY IMPACTS: The air quality analysis concluded that potential secondary air quality impacts from miscellaneous sources would be less than significant, no mitigation measures were required, so secondary air quality impacts remain less than significant.

4.2.6.3 Toxic Air Contaminants

PROJECT-SPECIFIC IMPACTS: A number of control measures that are proposed in the 2012 AQMP may result in the use of ammonia in SCRs. Ammonia slip from SCR units is restricted to five ppm or less, which has been shown through source-specific permit modeling to have no significant impact on surrounding communities. Therefore, the impact from the use of ammonia as proposed in the 2012 AQMP is expected to be less than significant.

In general, it is expected that the 2012 AQMP control measures would reduce emissions of TACs. The basis for this conclusion is that many TACs are also classified as VOCs. To the extent that control measures reduce VOC emissions, associated TAC emission reduction could occur as well. CTS-01, CTS-02, CTS-03 and CTS-04 are expected to reduce VOCs by reducing solvent content of coatings, mold release and consumer products.

As Subchapter 4.4, the toxicity of future coating formulations is generally less or no worse than conventional solvents overall but if a facility changes from using water-based products to using products that are reformulated with chemicals that may have new or different health hazards, significant adverse health hazard impacts could occur from using some low VOC reformulated products. However, as with the use of all chemicals, facilities and their workers would be required to continue to comply with existing health protective procedures when handling both flammable and toxic materials. Further, water-based coatings and products tend to contain less flammable and less toxic materials than solvent-based coatings and products. Consequently, future reformulated coatings and solvents are not expected to increase exposures to TAC emissions.

FUG-01, FUG-02 and FUG-03 would reduce VOCs from vacuum trucks; LPG transfer and dispensing; and equipment with fugitive emissions at oil and gas production facilities, petroleum and chemical products processing, storage and transfer facilities, marine terminals, and other sources MCS-01 would adopt additional retrofit technology, which depending on the source and control technology, would reduce criteria pollutants.

BCM-01, BCM-03, CMB-01, CMB-02, CMB-03, INC-01, IND-01, MSC-03 would reduce combustion emissions through the replacement of existing equipment with more efficient equipment, emission control technology or changes to processes at refineries. The reduction of combustion emission would reduce combustion TACs.

Some measures for motor vehicle and transportation source categories (ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06 and ADV-07) would reduce emissions of diesel exhaust particulate, which is a known carcinogen, and toxic components of gasoline such as benzene, toluene, and xylene. These control measures would result in replacing existing vehicles or equipment with more efficient vehicle or equipment, zero emission electric vehicles or equipment, or alternative fueled vehicles or equipment. Combustion emissions of alternative fuels have trace amounts of methanol and aldehyde, but, generally, are considered to cleaner and less toxic than diesel or gasoline fueled vehicles. Emissions from power generating equipment may include trace amounts of benzene, aldehydes, metals, and polynuclear aromatic hydrocarbons. However, if the process being electrified was previously powered by direct combustion of fossil fuels, then electrification is expected to result in an overall decrease in toxic emissions.

The overall impacts associated with implementation of the 2012 AQMP are an overall reduction in TACs. Therefore, no significant impacts from TACs have been identified.

PROJECT-SPECIFIC MITIGATION: No significant secondary air quality impacts from TACs have been identified so no mitigation measures are required.

REMAINING SECONDARY AIR QUALITY IMPACTS: The air quality analysis concluded that potential secondary air quality impacts from TACs would be less than significant, no mitigation measures were required, so secondary air quality impacts from TACs remain less than significant.

4.2.6.4 Global Warming

The 2012 AQMP as a whole is expected to promote a net decrease in GHG emissions, in part, because most GHG emissions in the district are generated by combustion processes. To the extent that 2012 AQMP control measures reduce or eliminate combustion processes in favor of near zero or zero emission technologies, GHG emission reduction co-benefit would also be expected to occur. The control measures that have potential GHG emissions impacts are presented in Table 4.2-8. The relative impacts (e.g., either an increase (+) or decrease (-)) are presented along with the activities associated with the impact (e.g., construction necessary to implement the control measure).

TABLE 4.2-9

Potential Impacts on Climate Change and Global Warming
from Implementation of 2012 AQMP Control Measures

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	CONTROL MEASURE GHG IMPACT[(a)]
SHORT-TERM PM2.5 CONTROL MEASURES			
BCM-03	Emission Reductions from Under-Fired Charbroilers	Add-On Control Equipment with Ventilation Hood Requirements (e.g., ESPs, HEPA filters, wet scrubbers, and thermal oxidizers).	+ (afterburners, construction, increased energy)
CMB-01	Further NOx Reductions from RECLAIM – *Phase I and Phase II*	Selective catalytic reduction, low NOx burners, NOx reducing catalysts, oxy-fuel furnaces, and selective non-catalytic reduction.	+ (increased energy, construction)
IND-01	Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities	Environmental lease conditions, port rules, tariffs, or incentives.	+ (afterburners, increased energy, reduced fuel economy associated with add-on pollution control equipment) - (conversion to alt fuels/reduction in conventional fuels)
MCS-01	Application of All Feasible Measures Assessment	District will adopt and implement new retrofit technology control standards as new BARCT standards become available.	+ (afterburners, increased energy)

TABLE 4.2-9 (CONTINUED)

Potential Impacts on Climate Change and Global Warming
from Implementation of 2012 AQMP Control Measures

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	CONTROL MEASURE GHG IMPACT[(a)]
OZONE CONTROL MEASURES			
CMB-02	NOx Reductions from Biogas Flares (NOx)	Replacement of existing biogas flares with more efficient biogas flares	+ (construction) (1) (more efficient flares)
CMB-03	Reductions from Commercial Space Heating (NOx)	This control measure seeks emission reductions from unregulated commercial fan-type central furnaces used for space heating.	+ (construction) (2) (more efficient commercial fan-type central furnaces)
MCS-02	Further Emission Reductions from Green Waste Processing (Chipping and Grinding Operations not associated with composting)	Require chipped or ground greenwaste material to be covered after chipping or grinding or removed from site, and seasonal covering of chipped or ground greenwaste material.	+ (construction)
MCS-03	Improved Start-up, Shutdown and Turnaround Procedures (All Pollutants)	Diverting or eliminating process streams that are vented to flares, and installing redundant equipment to increase operational reliability	+ (construction) - (potentially less flaring)
FUG-01	~~Further~~ VOC Reductions from Vacuum Trucks	VOC control devices such as carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers, liquid scrubbers and positive displacement (PD) pumps.	+ (construction, increased energy) + (afterburners, increased energy with add-on pollution control equipment)
FUG-02	Emission Reduction from LPG Transfer and Dispensing – Phase II	Expand applicability of rule to LPG transfer and dispensing at facilities other than those that offer LPG for sale to end users included currently exempted facilities.	+ (construction, increased energy, inspection vehicles)
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles (NOx)	Incentives to replace older vehicles with electric or hybrid vehicles.	+ (scrapping) - (electrification, conversion to alt fuels/reduction in conventional fuels)
ONRD-02	Accelerated Retirement of Older Light-Duty and Medium-Duty Vehicles (NOx)	Incentives to replace older light- and medium-duty vehicles with new or newer low-emitting vehicles.	- (scrapping) - (electrification, conversion to alt fuels/reduction in conventional fuels)
ONRD-03	Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium Heavy-Duty Vehicles (NOx)	Incentives to replace older medium-duty vehicles with low-emitting vehicles. Highest priority would be given to zero-emission vehicles and hybrid vehicles with a portion of their operation in an “all electric range” mode.	- (electrification, conversion to alt fuels/reduction in conventional fuels)

TABLE 4.2-9 (CONTINUED)

Potential Impacts on Climate Change and Global Warming from Implementation of 2012 AQMP Control Measures

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	CONTROL MEASURE GHG IMPACT[a]
ONRD-04	Accelerated Retirement of Older On-Road Heavy-Duty Vehicles (NOx, PM)	Incentives replace heavy-duty vehicles with newer or new vehicles. Priority would be placed on replacing older diesel trucks in Mira Loma.	- (conversion to alt fuels/reduction in conventional fuels) - (replacement with more efficient engines,
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards (NOx, PM)	Incentives to replace up to 1,000 heavy-duty vehicles with low-emitting vehicles or zero-emission container movement systems.	+ (construction) - (electrification, conversion to alt fuels/reduction in conventional fuels)
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment (NOx)	Accelerate Tier 0 and Tier 1 equipment replacement with Tier 4 equipment, use of air pollution control technologies (e.g., advanced fuel injection, air induction, and after-treatment technologies).	+ (increased energy, reduced fuel economy associated with add-on control equipment) - (replacement with more efficient engines, conversion to alt fuels/reduction in conventional fuels)
OFFRD-02	Further Emission Reductions from Freight Locomotives (NOx, PM)	Replace existing engines (Tier 0 through Tier 3 engines) with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	+ (increased energy, alt fuels, reduced fuel economy associated with add-on control equipment) - (replacement with more efficient engines)
OFFRD-03	Further Emission Reductions from Passenger Locomotives (NOx)	Repower existing Tier 0 and Tier 2engines with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	+ (engine repower, increased energy, reduced fuel economy associated with add-on control equipment) - (replacement with more efficient engines,
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels at Berth	Shore power of vessels at berth, use of air pollution control technologies on exhaust gases from auxiliary engines and boilers (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	+ (construction, increased energy, reduced fuel economy associated with add-on control equipment) - (electrification)
ADV-01	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles (NOx)	Construct "wayside" electric or magnetic infrastructure, construction battery charging and fueling infrastructure. Alternatively, if battery, fuel cell or other zero/near zero emission technologies progress sufficiently, the need for wayside power for rail or trucks may be diminished or eliminated.	+ (construction, increased energy) - (electrification ,conversion to alt fuels/reduction in conventional fuels)

TABLE 4.2-9 (CONCLUDED)

Potential Impacts on Climate Change and Global Warming
from Implementation of 2012 AQMP Control Measures

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	CONTROL MEASURE GHG IMPACT[a]
ADV-02	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives (NOx)	Construct "wayside" electric , magnetic, battery-hybrid system, or fuel cell infrastructure, construct battery charging or fueling infrastructure.	+ (construction, increased energy) - (electrification, conversion to alt fuels reduction in conventional fuels)
ADV-03	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment (NOx)	Construct electric gantry cranes, construct battery charging or fueling infrastructure, and use of alternative fuels.	+ (construction, increased energy) - (electrification, conversion to alt fuels reduction in conventional fuels)
ADV-04	Actions for the Deployment of Cleaner Commercial Harborcraft (NOx)	Construct battery charging or fueling infrastructure, use of air pollution control equipment (e.g., SCR, use of alternative fuels).	+ (construction, increased energy, reduced fuel economy associated with add-on control equipment)
ADV-05	Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels (NOx)	Employ after treatment control technologies such as SCR and sea water scrubbers, and use of alternative fuels.	+ (construction, increased energy, reduced fuel economy associated with add-on control equipment)
ADV-06	Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment (NOx)	Construct battery charging or fueling infrastructure, and increased use of alternative fuels	+ (construction, increased energy) - conversion to alt fuels/reduction in conventional fuels)
ADV-07	Proposed Implementation Measures for the Deployment of Cleaner Aircraft Engines (NOx)	Use alternative fuels, lean combustion burners, high rate turbo bypass, advanced turbo-compressor design, and engine weight reduction.	- (conversion to alt fuels/reduction in conventional fuels)

(a) + Control measure is expected to result in an increase in GHG emissions
- Control measure is expected to result in a decrease in GHG emissions

A number of mobile source control measures would reduce GHG emissions through accelerated penetration of partial zero-emission and zero emission vehicles and use of alternative fuels such as natural gas, the combustion of which generates less GHG emissions than diesel fuel. The 2012 AQMP reported a 2008 GHG inventory of 154.82 million metric tons, of which 11.66 million metric tons are associated with power generation. Implementation of the proposed control measures is expected to reduce GHG emissions consistent with the AB32 scoping plan. However, an increase in electricity demand to implement Control Measures ONRD-01, ONRD-02, ONRD-03, ADV-01, and ADV-02 is expected to be about 1,691.2 GWh in 2023 and produce approximately 0.171 million metric tons of greenhouse gas emissions or approximately 0.11 percent of the 2008 greenhouse gas inventory for the district.

The reduction in petroleum fuels demand from implementation of Control Measures ONRD-01, ONRD-02, ONRD-03, and ONRD-04 is expected to be 60,150,808 gallons in 2023 (see Table 4.3-6), of which it is assumed 27,608,834 gallons would be motor gasoline with a CO2 emission factor of 8.78 kg/gal and 40,087,519 gallons would be diesel fuel with a CO2 emission factor of 10.05 kg/gal. The greenhouse gas emissions would be reduced by slightly more than 0.648 metric tons in 2023 when adjusting for nitrous oxide and methane emissions. Therefore, overall reduction in GHG emissions from implementation of Control Measures ONRD-01, ONRD-02, ONRD-03, and ONRD-04 would be approximately 0.477 million metric tons and no significant impact to GHG emissions would be expected as shown in Table 4.2-9.

TABLE 4.2-10

Estimated GHG Emission Impacts from
Control Measures ONRD-01, ONRD-02, ONRD-03, and ADV-02

Description	CO_2 Emissions (million metric tons)	CO_2eq Emissions (million metric tons)
Increased Electricity	0.1712	0.1715
Change in Gasoline Use	-0.2424	-0.2447
Change in Diesel Use	-0.4029	-0.4033
Net Change in Emissions	-0.4741	-0.4765

(a) Source: 2012 AQMP Appendix III.
Negative numbers represent emission reductions.

Control Measures BCM-03, CMB-01, CMB-02, CMB-03, IND-01, MCS-01, MCS-02, MCS-03, INC-01, FUG-01, FUG-02, FUG-03, OFFRD-01, OFFRD-04, OFFRD-05, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06 are expected to have GHG emissions associated with construction. Construction emissions impacts are amortized over a 30-year timeframe. As such, individual projects typically do not generate significant GHG impacts during the construction phase.

Control Measures BCM-03, CMB-01, IND-01, MCS-01, FUG-01, FUG-02, INC-01, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-05 have the potential to increase energy demand by implementing control measures that would use electricity to power add-on control devices or power catenary systems for fixed-route mobile sources. Projects involving catenary systems would reduce diesel combustion emissions. As with the on-road control measures discussed previously, converting from diesel-fired sources to electricity generated by primarily natural gas, GHG emissions are expected to decrease. Projects to install catenary systems are expected to require project-specific CEQA review where global climate change and ozone depletion would be analyzed. Add-on control devices are sized for the specific source that is being controlled, as such the additional energy demand is highly variable from source to source. The energy to power these control measures is expected to be provided by public utility companies. As discussed in Subchapter 4.3 of this Final Program EIR, additional power generating facilities are expected due to general growth, but no new power generating facilities are expected as a result of implementing the 2012 AQMP. Power generating facilities are subject to AB-32 and will be required to reduce GHG emissions by 2020. Therefore, the additional energy necessary to implement add-on control devices and catenary systems are not expected to have significant GHG emissions.

Control Measures IND-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-O4, ADV-01, ADV-02, ADV-03, ADV-06, and ADV-07 have the potential to require the use of alternative fuels. Both the use and production of alternative fuels is expected to decrease emissions as discussed previously in the Potential Impacts from Mobile Sources. Alternative fuels generate less GHG emissions when combusted compared to gasoline and diesel and generate less GHG emissions from production when compared to petroleum products. Therefore, no increase in GHG emissions is expected from the use of alternative fuels and no significant impacts are expected.

Based on the analysis presented above, global climate change and ozone depletion impacts are expected to be less than significant.

PROJECT-SPECIFIC MITIGATION: No significant air quality impacts from GHG emissions have been identified so no mitigation is required.

REMAINING AIR QUALITY IMPACTS: The air quality analysis concluded that potential secondary air quality impacts from GHG emissions would be less than significant, no mitigation measures were required, so secondary air quality impacts from GHG emissions remain less than significant.

4.2.6.5 Stratospheric Ozone Depletion

PROJECT-SPECIFIC IMPACTS: None of the control measures are expected to require the use of stratospheric ozone depleting substances. None of the control measures are expected to require additional control of stratospheric ozone depleting substances. Therefore, no adverse stratospheric ozone depleting impacts are expected from the proposed project.

PROJECT-SPECIFIC MITIGATION: No significant air quality impacts from stratospheric ozone depletion have been identified so no mitigation is required.

REMAINING AIR QUALITY IMPACTS: The air quality analysis concluded that potential secondary air quality impacts from stratospheric ozone depletion would be less than significant, no mitigation measures were required, so secondary air quality impacts from stratospheric ozone depletion remain less than significant.

4.2.7 Summary of Air Quality Impacts

The following is the summary of the conclusions of the analysis of secondary air quality impacts associated with implementation of the 2012 AQMP.

- Construction Activities: The emissions associated with construction activities due to the implementation of the control measures in the 2012 AQMP were considered to be significant for CO and PM10 emissions.

- Secondary Emissions from Increased Electricity Demand: While there may be an increase in electricity, the existing air quality rules and regulations are expected to minimize emissions associated with increased generation of electricity. The impacts associated with secondary emissions from increased electricity demand are expected to be less than significant.

- Secondary Emissions from the Control of Stationary Sources: No significant secondary air quality impacts from control of stationary sources were identified associated with implementation of the 2012 AQMP.

- Secondary Emissions from Change in Use of Lower VOC Materials: The secondary air quality impacts associated with reformulated products are expected to be less than significant.

- Secondary Emissions from Mobile Sources: The overall impact of mobile sources due implementation of the control measures has been considered less than significant for all pollutants.

- Secondary Emissions from Increased Use of Fuels due to Reduction in Fuel Economy: The reduction in fuel economy is expected to be about one percent for the affected sources so a potential increase in fuel use could occur. However, the overall focus of the 2012 AQMP is to reduce PM2.5 and ozone emissions, which is primarily driven by increasing use of cleaner fuels. Therefore, the impact of fuel economy is expected to be less than significant.

- Secondary Emissions from Miscellaneous Sources: The impacts of the control measures on secondary emissions from miscellaneous sources were determined to be less than significant.

- Non-Criteria Pollutants: Electrification may cause greater emissions of benzene, aldehydes, metals, and polycyclic aromatic hydrocarbons from fuel-based power generating facilities. However, if the process being electrified was previously powered by direct combustion of fossil fuels, then electrification may result in an overall decrease in toxic emissions. No significant secondary air quality impacts were identified from non-criteria pollutants, so no mitigation measures are required.

- Global Warming and Ozone Depletion: The 2012 AQMP is expected to have a net effect of reducing emissions of compounds that contribute to global warming and ozone depletion so that no significant adverse impacts are expected.

- Ambient Air Quality: The 2012 AQMP is expected to: 1) attain the 24-hour federal PM2.5 by 2014 (see Figure 4.2-3); 2) implement specific measures to implement Clean Air Action §182 (e)(5) to assist in attaining the eight-hour ozone standard by 2023; 3) maintain compliance with state and federal NO_2 standards (even considering the increase in population growth); 4) maintain compliance with state and federal SO_2 standards (even considering the increase in population growth); and, 5) maintain compliance with the federal 24-hour average PM10 standard.

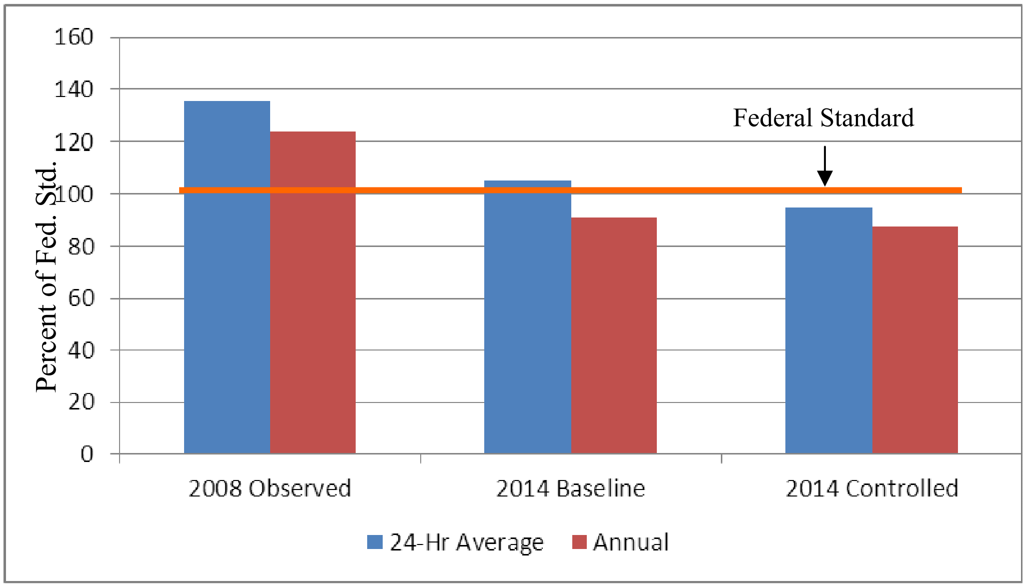

FIGURE 4.2-3

Projection of Future Air Quality in the Basin in Comparison with the Federal Standards.

Summary of PM2.5 Control Measure Impacts: The air quality impacts associated with PM2.5 Control Measures (BCM-03, CMB-01, IND-01, and MCS-01) were evaluated and determined to be significant for construction activities and less than significant for secondary emissions from increased electricity demand, control of stationary sources, change in us of lower VOC materials, mobile sources, increase us of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone depletion.

Summary of Ozone Control Measure Impacts: The air quality impacts associated with the 23 Ozone Control Measures (see Table 4.2-1) were evaluated and determined to be significant for construction activities and less than significant for secondary emissions from increased electricity demand, control of stationary sources, change in us of lower VOC materials, mobile sources, increase us of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone depletion.

SUBCHAPTER 4.3

ENERGY

4.3 ENERGY

4.3.1 Introduction

This subchapter examines impacts on the supply and demand of energy sources from proposed control measures in the 2012 AQMP. All control measures in the 2012 AQMP were evaluated to determine whether or not they could generate direct or indirect energy impacts based on the anticipated methods of control. Some of the measures would require increased energy use, for example through increased pumping loads or more extensive exhaust filtering systems. Other measures would alter the form of energy used, for example switching from gasoline or diesel power to alternative fuels such as hydrogen, natural gas, and electricity.

4.3.2 2012 AQMP Control Measures with Potential Energy Impacts

The energy impact analysis in this Final Program EIR identifies the net effect on energy resources from implementing the 2012 AQMP. All control measures were analyzed to identify both beneficial effects (energy conserving) and adverse impacts (energy consuming).

Implementing some of 2012 AQMP control measures could increase energy demand in the region from affected facilities. Specifically some types of control equipment would increase demand for electrical power to operate the equipment, natural gas for combustion devices, natural gas used as an alternative clean fuel for mobile sources, etc.

Evaluation of control measures was based on examination of the impact of the control measures and technologies in light of current energy trends. Evaluation of control methods for each control measure indicated that there are 25 control measures that could have potential energy consumption or conserving impacts. As shown in Table 4.3-1, three control measures related to PM2.5 emission reductions and 22 control measures related to emission reductions from ozone precursors are expected to have energy impacts.

4.3.3 Significance Criteria

Implementation of the 2012 AQMP would be considered to have significant adverse energy impacts if any of the following conditions occur:

- The project would result in the use of renewable and non-renewable fuel or energy resources, in a wasteful manner.
- The project conflicts with adopted energy conservation plans or standards.
- The project would result in substantial depletion of existing energy resource supplies.
- The project would increase demand for utilities impacts the current capacities of the electric and natural gas utilities.

- The project would increase demand for energy resources by one percent or more of the baseline energy demand.

TABLE 4.3-1

Control Measures with Potential Secondary Energy Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	ENERGY IMPACT
Short-Term PM2.5 Control Measures			
BCM-01	Further Reductions from Residential Wood Burning Devices (NOx)	Lower current mandatory Basin-wide wood burning curtailment threshold from 35 $\mu g/m^3$ to 30 $\mu g/m^3$.	Potential increased demand for natural gas.
BCM-03 (formerly BCM-05)	Emission Reductions from Under-Fired Charbroilers (PM2.5)	Add-On Control Equipment with Ventilation Hood Requirements (e.g., ESPs, HEPA filters, wet scrubbers, or thermal oxidizers)	Potential increase in electricity and/or natural gas for control technologies. Potential increase in diesel-fuel demand during construction and/or filter replacement.
BCM-04 (formerly MCS-04B)	Further Ammonia Reductions from Livestock Waste (NH3)	Reducing pH level in manure through the application of acidifier sodium bisulfate to	Potential increase in diesel fuel demand use for delivery and application of acidifier.
CMB-01	Further NOx Reductions from RECLAIM – Phase I and Phase II (NOx)	RECLAIM sources will be examined for further reductions for this control measure and potential rule making. Control technologies could include: elective catalytic reduction, low NOx burners, NOx reducing catalysts, oxy-fuel furnaces, and selective non-catalytic reduction	Potential increase in electricity and/or natural gas for control technologies. Potential increase in diesel-fuel demand during construction and related ammonia and/or catalyst replacement.
CMB-02	NOx Reductions from Biogas Flares (NOx)	Replacement of existing biogas flares with more efficient biogas flares	Potential increase in diesel-fuel demand during construction.
CMB-03	Reductions from Commercial Space Heating (NOx)	This control measure seeks emission reductions from unregulated commercial fan-type central furnaces used for space heating.	Potential increase in diesel-fuel demand during construction.
IND-01	Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities (NOx, SOx, PM2.5)	Environmental lease conditions, port rules, tariffs or incentives	Additional emission controls could result in increased electricity. Incentives to purchase electric or gaseous fueled equipment could cause potential increase in electricity and natural gas demand. Potential increase in alternative fuels. Potential increase in diesel-fuel demand during construction.

TABLE 4.3-1 (CONTINUED)

Control Measures with Potential Secondary Energy Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	ENERGY IMPACT
Ozone Control Measures			
CTS-02	Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants (VOC)	Reduce the allowable VOC content in product formulations by using alternative low-VOC products or non-VOC product/equipment	Potential increase in electricity use for application and/or control
FUG-01	~~Further~~ VOC Reductions from Vacuum Trucks (VOC)	VOC control devices such as carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers, liquid scrubbers and positive displacement (PD) pumps	Potential increase in electricity and/or natural gas for control technologies. Potential increase in diesel-fuel demand during construction and related ammonia and/or catalyst replacement.
FUG-02	Emission Reduction from LPG Transfer and Dispensing – Phase II (VOC)	Expand applicability of rule to LPG transfer and dispensing at facilities other than those that offer LPG for sale to end users included currently exempted facilities	Potential increase in diesel-fuel demand during construction and inspection and monitoring.
FUG-03	Further ~~VOC~~ Reductions from Fugitive VOC Emissions (VOC)	Upgrade inspection/ maintenance rules to at least a self-inspection program, or to an optical gas imaging-assisted LDAR program where feasible; use of new technologies to detect and verify VOC fugitive emissions	Potential increase in electricity and/or natural gas for control technologies. Potential increase in diesel-fuel demand during construction and inspection and monitoring/inspections.
MCS-01	Application of All Feasible Measures Assessment (All Pollutants)	Control measure could require new retrofit technology control standards as new BARCT standards become available.	Potential increase in electricity and/or natural gas for control technologies. Potential increase in diesel-fuel demand during construction and/or related transportation.
MCS-02	Further Emission Reductions from Green Waste Processing (Chipping and Grinding Operations not associated with composting) (VOC)	Require chipped or ground greenwaste material to be covered after chipping or grinding or removed from site; and seasonal covering of chipped or ground greenwaste material.	Potential increase in diesel-fuel related transportation.
MCS-03	Improved Start-up, Shutdown and Turnaround Procedures (All Pollutants)	Diverting or eliminating process streams that are vented to flares, and installing redundant equipment to increase operational reliability.	Reduction of process gas vented to flares. Potential increase in diesel-fuel during construction.

TABLE 4.3-1 (CONTINUED)

Control Measures with Potential Secondary Energy Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	ENERGY IMPACT
Ozone Control Measures			
INC-01	Economic Incentive Programs to Adopt Zero and Near-Zero Technologies (NOx)	Installation of cleaner, more efficient combustion equipment, such as boilers, water heaters and commercial space heating or installation of control technologies including fuel cells, diesel particulate filters (DPF), NOx reduction catalysts, alternative electricity generation, such as wind and solar, battery electric, hybrid electric, and usage of low NOx and alternative fuels such as natural gas	Incentives to purchase electric or gaseous fueled equipment could cause potential increase in electricity and natural gas demand. Potential increase in electricity and/or natural gas for control technologies. Potential increase in diesel-fuel during construction and related filter and/or catalyst replacement.
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles (VOC, NOx, PM)	Incentives to replace older vehicles with electric or hybrid vehicles	Incentives to purchase electric vehicle could result in an increase in electricity.
ONRD-02	Accelerated Retirement of Older Light-Duty and Medium-Duty Vehicles (VOC, NOx, PM)	Incentives to replace older light- and medium-duty vehicles with low-emitting vehicles.	Incentives to purchase electric vehicle could result in an increase in electricity.
ONRD-03	Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium Heavy-Duty Vehicles (NOx, PM)	Incentives to replace older medium-duty vehicles with low-emitting vehicles. Highest priority would be given to zero-emission vehicles and hybrid vehicles with a portion of their operation in an "all electric range" mode.	Incentives to purchase electric vehicle could result in an increase in electricity and increase the use of alternative fuels.
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards (NOx, PM)	Incentives to replace older medium- and heavy-duty vehicles with low- and zero emitting vehicles.	Incentives to purchase low emission vehicles could result in an increase in electricity and increase the use of alternative fuels.
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment (NOx)	Accelerate equipment repowering; use of air pollution control technologies (e.g., advanced fuel injection, air induction, and after-treatment technologies).	Potential increase in the use of alternative fuels.

TABLE 4.3-1 (CONTINUED)

Control Measures with Potential Secondary Energy Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	ENERGY IMPACT
Ozone Control Measures			
OFFRD-02	Further Emission Reductions from Freight Locomotives (NOx, PM)	Repower existing engines with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Potential increase in fuel use from the use of more efficient engines; minor decrease in fuel use from loss of efficiency to control technologies, and increase in alternative fuels associated with repowered engines.
OFFRD-03	Further Emission Reductions from Passenger Locomotives (NOx, PM)	Repower existing engines with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Potential increase in fuel use from the use of more efficient engines; minor increase in fuel economy from loss of efficiency to control technologies, and increase in alternative fuels associated with repowered engines.
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels at Berth (VOC, NOx, PM)	Shore power of vessels at berth; use of air pollution control technologies on exhaust gases from auxiliary engines and boilers (e.g., SCRs, DPM filters, electric batteries, and alternative fuels). May increase the use or installation of new local electricity generation.	Potential increase in electricity use associated with increased use of shore-side power and additional air pollution control technologies and minor increase in fuel economy from loss of efficiency to control technologies. Potential increase in diesel-fuel during construction.
OFFRD-05	Emission Reductions from Ocean-Going Marine Vessels (NOx)	Enhance Ports' existing financial incentive programs for early deployment of Tier 2 and Tier 3 vessels calling at the Ports.	Potential increase in electricity use associated with increased use of shore-side power and additional air pollution control technologies and minor decrease in fuel use from loss of efficiency to control technologies. Potential increase in diesel-fuel demand during construction.
ADV-01	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles (NOx)	Construct "wayside" electric or magnetic infrastructure; construction battery charging and fueling infrastructure	Reduced emission standards could result in an increase in electricity and increase the use of alternative fuels. Potential increase in diesel-fuel demand during construction.

TABLE 4.3-1 (CONCLUDED)

Control Measures with Potential Secondary Energy Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	ENERGY IMPACT
Ozone Control Measures			
ADV-02	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives (NOx)	Construct "wayside" electric or magnetic infrastructure; construct battery charging or fueling infrastructure.	Measure could result in an increase in electricity and increase the use of alternative fuels. Potential increase in diesel-fuel demand during construction.
ADV-03	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment (NOx)	Construct electric gantry cranes; construct battery charging or fueling infrastructure; use of alternative fuels and fuel additives	Measure could result in an increase in electricity and increase the use of alternative fuels. Potential increase in diesel-fuel demand during construction.
ADV-04	Actions for the Deployment of Cleaner Commercial Harborcraft (NOx)	Construct battery charging or fueling infrastructure; use of air pollution control equipment (e.g., SCR; use of alternative fuels and fuel additives).	Measure could result in an increase in electricity and increase the use of alternative fuels. Potential increase in diesel-fuel demand during construction. Increase in fuel consumption from loss of efficiency from control equipment.
ADV-05	Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels (NOx)	Employ aftertreatment control technologies such as SCR and wet/dry scrubbers; use of alternative fuels.	Measure could result in an increase in electricity and increase the use of alternative fuels. Potential increase in diesel-fuel demand during construction. Increase in fuel consumption from loss of efficiency from control equipment.
ADV-06	Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment (NOx)	Construct battery charging or fueling infrastructure; increased use of alternative fuels and fuel additives.	Measure could result in an increase in electricity and increase the use of alternative fuels.
ADV-07	Proposed Implementation Measures for the Deployment of Cleaner Aircraft Engines (NOx)	Use alternative fuels and fuel additives, lean combustion burners, high rate turbo bypass, advanced turbo-compressor design, and engine weight reduction.	Measure could result in an increase use of alternative fuels.

4.3.4 Potential Energy Impacts and Mitigation Measures

4.3.4.1 Electricity

Potential electric energy impacts relative to the energy baseline are discussed below. The potential increase in electricity use due to implementation of the 2012 AQMP is partially associated with the potential installation of add-on control equipment. A number of control measures could result in the installation of add-on control equipment including BCM-03 - Emission Reductions from Under-Fired Charbroilers, CMB-01 - Further NOx Reductions from RECLAIM –Phase II, IND-01 - Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities (if triggered), FUG-01 - ~~Further~~ VOC Reductions from Vacuum Trucks, FUG-03 - Further ~~VOC~~ Reductions from Fugitive VOC Emissions, MCS-01 - Application of All Feasible Measures Assessment, and INC-01 -- Economic Incentive Programs to Adopt Zero and Near-Zero Technologies. There is also a potential increase in electricity use associated with the electrification of mobile sources or control equipment for mobile sources, including IND-01, INC-01, ONRD-01 - Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles, ONRD-02 - Accelerated Retirement of Older Light-Duty and Medium-Duty Vehicles, ONRD-03 - Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium Heavy-Duty Vehicles, ONRD-05 - Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards, OFFRD-01 - Extension of the SOON Provision for Construction/Industrial Equipment, OFFRD-02 - Further Emission Reductions from Freight Locomotives, OFFRD-03 - Further Emission Reductions from Passenger Locomotives, OFFRD-04 - Further Emission Reductions from Ocean-Going Marine Vessels at Berth, ADV-01 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles, ADV-02 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives, ADV-03 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment, ADV-04 - Actions for the Deployment of Cleaner Commercial Harborcraft, ADV-05 - Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels, and ADV-06 - Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment.

Stationary and Area Sources - A number of control measures could result in the installation of add-on control equipment including BCM-03, CMB-01, IND-01, CTS-02, FUG-01, FUG-03, MCS-01, and INC-01. Add-on control equipment can reduce air emissions in a number of different ways (e.g., filters to remove particulates, or units that produce a chemical reaction to remove a pollutant), but they generally require energy to function. The use of add-on air pollution controls (e.g., wet scrubbers, low NOx burners, and catalysts) could result in an increase in electricity demand. For example, a wet gas electrostatic precipitator (ESP) and wet gas scrubber (WGS) were installed on the Fluid Catalytic Cracking Unit (FCCU) at the ConocoPhillips Los Angeles Refinery. The estimated electricity required to operate the ESP and WGS was about 715 kilowatts (kW) (SCAQMD, 2007). FCCUs are large emission sources and the electricity used for the ESP and WGS at the ConocoPhillips Refinery would be representative of control equipment for large sources. Energy use for smaller sources would be less. The specific potential increase in the amount of electricity use due to the implementation of the 2012 AQMP is unclear at this time as specific information regarding the number and size of the control units are currently unknown. Additionally, alternative processing equipment is expected to be the primary method of control for some of the control measures. For example, the primary method of control of VOC emissions from coatings and solvents (CTS-01 and CTS-02) is expected to be reformulation of coatings and solvents along with more efficient application techniques, and not add-on control equipment which would be largely expected to be energy neutral.

Mobile Sources - Mobile source control measures in the 2012 AQMP are expected to increase the electricity demand in the district. A number of control measures would result in an increase in electricity demand associated with the electrification of mobile sources, including IND-01, ONRD-01, ONRD-02, ONRD-03, ONRD-05, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06. This is expected to shift some of the fuel source of cars, trucks, off-road vehicles and marine vessels to electricity, as well as, create an additional electrical load demand due to CNG recharging. The CEC estimates there were about 10,000 electric vehicles on the road operating in California in 2011 with an estimated electricity consumption of 100 gigawatts per hour (gWh). The CEC projects anywhere from 835,000 to 3,575,000 electric vehicles by 2022 depending on the energy demand scenario. These vehicles will require 2,200 gWh for the low demand scenario and more than 7,000 gWh in the high scenario (CEC, 2012j).

The estimated baseline electricity use in Los Angeles, Orange, Riverside, and San Bernardino counties was about 115,000 gWh in 2010 (CEC, 2012b). Therefore, currently electric vehicles are a small portion of the overall electricity used (less than 0.1 percent). CEC estimates that an increase in electricity demand of about 18 percent will occur between 2010 and 2023 with an annual average growth rate of about 1.3 percent (CEC, 2012j). Assuming a similar annual growth rate between 2023 and 2030, about 148,750 gWh will be required in 2030 (see Table 4.3-2).

The potential increase in electricity can be estimated for Control Measures ONRD-01, ONRD-02, ONRD-03, and ONRD-05 where the increase in the number of hybrid/zero emission vehicles introduced can be estimated (see Table 4.3-2)[1]. As shown in Table 4.3-2, the estimated increase in electricity associated with associated with ONRD-01, ONRD-02, ONRD-03, and ONRD-05 is about 446.2 gWh. In 2023, the increase in electricity would represent a 0.4 percent increase in electricity since 2010 (baseline). ADV-01 could result in the construction of "wayside" electric or magnetic power built into roadway infrastructure to boost the pulling capacity or range of the heavy-duty vehicles. The “wayside” electric or magnetic power for appropriately equipped heavy-duty trucks would require additional electricity. The recently circulated Draft EIR for the I-710 Corridor Project included an alternative that evaluated impacts from installing “wayside” electric roadway infrastructure and an estimated electricity demand between 157 and 183 GWh per year (Caltrans, 2012) In addition to the I-710 Corridor Project, ADV-01 identifies the 60 freeway as an east-west

[1] It should be noted that the specific technologies to be employed to comply with these 2012 AQMP control measures is unknown. However, to present a worst-case analysis of potential electricity demand impacts, for the purposes of this analysis, it is assumed that all affected mobile sources would be powered by electricity. Similarly, this worst-case assumption does not assume that the SCAQMD endorses electricity technologies over other compliant technologies.

corridor that has potential location for additional “wayside” electric roadway infrastructure. There is currently a pilot project under consideration to install catenary lines at one of two sites, a site along the Terminal Island Freeway or on Navy Way at the Port of Los Angeles. To estimate the potential electrical demand for a “wayside” electric roadway infrastructure on the 60 freeway, it is assumed that the electrical demand per mile would be equivalent to that estimated for the I-710 Corridor Project with a distance twice as long. Therefore, the estimated electrical demand for the 60 freeway would be between 320 and 380 GWh. The use of “wayside” electric roadway infrastructure elsewhere in the district would be speculative at this time. Therefore, the estimated electrical demand associated with ADV-01 is 563 GWh (see Table 4.3-2).

ADV-02 could result in the construction of "wayside" electric or magnetic power built into railway infrastructure to convert diesel locomotives to electrical traction motors. The “wayside” electric or magnetic power would require additional electricity. ADV-02 would convert 300 line haul, 140 switcher, and 52 passenger diesel locomotives to “wayside” electric infrastructure. Based on an annual fuel use of 34.7 million gallons of diesel fuel, the estimated electrical demand would be 880 GWh (see Table 4.3-2). The 880 GWh assumes 56 percent diesel engine efficiency, 95 percent electrical traction efficiency, and seven percent transmission loss.

TABLE 4.3-2

Electricity Impacts for Los Angeles, Orange, Riverside, and San Bernardino Counties (GW-h)

CONTROL MEASURE	2010	2023 [A]
Baseline	115,000	136,079
ONRD-01 – Incentivize light- and medium-duty trucks (9,000 vehicles) [c]	--	38.6
ONRD-02 – Accelerated retirement and replacement of pre-1992 light- and medium-duty vehicles (18,000 vehicles) [b]	--	77.1
ONRD-03 – Encourage the introduction of hybrid and zero-emission vehicles (5,000 vehicles) [c]	--	83
ONRD-05 – Replace 1000 trucks with zero-emission vehicles (1000 vehicles) [e]	--	49.5
ADV-01 – “Wayside” Electric Roadway Infrastructure of the I-710 and 60 Freeways		563
ADV-02 – “Wayside” Electric Rail Infrastructure		880
Total of Mobile Source Measures	--	1,691
Percent of Baseline	--	1.5%

Source: CEC, 2012a
[a] Projections based on CEC, 2012j
[b] Based on 12,600 miles/year and 0.34 kWh/mile.
[c] Based on 16,600 miles/year and one kWh/mile.
[d] Based on 16,600 miles/year and one kWh/mile.
[e] Table 3.3-1

ADV-03 would result in the deployment of zero and near-zero emission cargo handling equipment which could result in an increase in electricity use (e.g., electric gantry cranes).

The Southern California International Gateway Project (Los Angeles Harbor Department, 2011) is proposing to use electric gantry cranes to move cargo from trucks to rail. The estimated increase in electricity to operate the electric gantry cranes ranges from 5,500,000 to 8,700,000 kWh for industrial uses that include electric gantry crane operations (as well as rail track signals/ lighting, site and security lighting, administrative offices, and maintenance and repair building operations). The use of the electric gantry cranes are the largest portion of the estimated electricity use at this facility. While this is only an example of electricity use for cargo handling equipment, the electrification of cargo handling equipment throughout the ports could require a substantial amount of electricity.

Control Measure IND-01 is a backstop measure that would require the ports to control stationary and mobile sources at the port and port-related facilities in the event that controls at the ports are needed or the emission targets assumed in the 2012 AQMP for the port-related sources are not met. One goal of the ports' Clean Air Action Plan and IND-01 is to move all container berths, cruise ship operations, and other frequent visitors calling at the ports to shore-side power and to move other vessel types toward alternative hotelling emissions reduction technologies. With regard to shore-side power, the two ports are in different positions from an infrastructure standpoint. Generally, the Port of Los Angeles has the main electrical trunk lines in place from which to "step down" and condition power for ships. The Port of Long Beach, on the other hand needs to bring new electrical service lines from Interstate 405 into the Harbor District to supply the appropriate power, which will require significant infrastructure improvements (PLAX/PLB, 2010).

Over the next five years, the Port of Los Angeles proposes to conduct a massive infrastructure improvement program to make alternative marine power (referred to as AMP) available at a number of berths at container, liquid bulk terminals, cruise terminals, and dredge plug-in locations. The Port of Los Angeles is expected to have alternative marine power available at 24 berths by 2014 (PLAX/PLB, 2010). However, since IND-01 is a backstop measure so it is unclear if it would need to be implemented and, if it would need to be implemented, to what extent it would need to be implemented. Further, details of the measure and the means for reducing emissions have not been identified; electricity usage from this measure cannot be estimated at this time.

OFFRD-05 - Emission Reductions from Ocean-Going Marine Vessels may increase electricity use to shore power marine vessels at berth. This control measure would provide incentives for the cleanest marine vessels (e.g., Tier III) to visit the ports. Although not anticipated, electrical power for hotelling operations could be provided to these ships via electrical cables using shorepower. Shorepower can be locally generated at the port or obtained from the grid. Shorepower can be locally generated using clean technologies such as fuel cells, gas turbines, microturbines, and combined cycle units. Due to technical and operational (e.g., frequency of calls) reasons, however, cold ironing may not be a viable option for all types of ships.

The Port of Long Beach is actively implementing its shore power program. In 2006, the port began improvements on the shore power infrastructure at the BP terminal at berth T121. Construction is completed and since mid-2009, the shore power infrastructure has been operational and is being used. Over the next five years, the port will continue to undergo electrical infrastructure improvements, constructing an additional 6.6 kV sub-transmission line to serve the Port of Long Beach Harbor District, and completing infrastructure improvements for the remaining container terminals, electric dredge plug-ins, and additional infrastructure for electrification of certain types of yard equipment. Over 23 berths at container terminals at the Port of Long Beach are scheduled to be shore power ready by the end of 2014 (PLAX/PLB, 2010).

The EIR prepared for the Middle Harbor development in the Port of Long Beach estimated that the electricity consumption would be about 986 megawatt-hours for the Middle Harbor container terminal operations that would include shore-to-ship power ("cold-ironing") and connections to buildings and other wharf structures (e.g., lighting). While the increase demand was considered extensive, it was determined to not be substantial relative to the existing and project regional electricity supply (Port of Long Beach, 2009).

Based on the above information, since the means of reducing emissions and the details of whether local or grid power have not been established, electricity usage associated with OFFRD-05 cannot be estimated at this time.

In spite of energy conservation programs in California, it is likely that additional power plants will be required to supply the projected electricity due to general population growth, both in California and outside of California. Increased demand for electricity would occur with or without implementing the 2012 AQMP. Currently, there are a number of power plant projects planned in southern California to meet future needs. Relative to the existing electricity use and the projected future peak electricity demand, implementation of all the control measures is expected to result in an overall increase in 2023 of approximately 1.5 percent of the existing electricity use of 115,000 GW-h (see Table 4.3-2). While this increase is expected to be within the electric generating capacity of the region, an increase in electricity of one percent or greater exceeds the SCAQMD's energy significance threshold. Thus, the electric energy impacts from the implementation of the 2012 AQMP are expected to be significant.

Conclusion: Electricity - The electric energy impacts presented above for those control measures where sufficient data exist, are expected to be conservative. The demands for electricity associated with increased electrification of mobile sources could be partially offset by charging equipment (e.g., electric vehicles) at night when the electricity demand is low, thus minimizing impacts on peak electricity demands. Further, the analysis assumes that all sources affected by a control measure that has the potential to increase demand for electricity, would use electricity rather than the more likely result of multiple types of energy being used. In addition, any increase in electricity demand would likely result in a concurrent reduction in demand for other types of fuels, particularly petroleum-based fuels. The 2012 AQMP is not expected to result in the use of large amounts of fuel or energy resources or result in the use of fuel or energy resources in a wasteful manner. However, the 2012 AQMP includes incentives to shift from diesel and gasoline fuel use to increased electrification of stationary and mobile sources. Depending on the location and the amount of energy use (e.g., port projects), electricity portions of energy conservation plans may need to be updated. Therefore, the proposed project may conflict with existing adopted energy conservation plans. Therefore, the 2012 AQMP could result in a substantial increase in electricity (greater than one percent of the existing electricity use in the Basin), and increased electricity demand is potentially significant.

The 2012 AQMP includes strategies that promote energy conservation (EDU-01) without identifying specific targets; therefore, its benefits have not been quantified in this analysis. Nonetheless, the 2012 AQMP impacts on electricity resources are potentially significant.

Project-Specific Mitigation: Mitigation measures are required as potentially significant impacts on electricity demand associated with the 2012 AQMP have been identified. As individual control measures are promulgated as new rules or rule amendment, specific mitigation measures will be identified as necessary to minimize electricity impacts. Mitigation measures are expected to include the following:

E-1 Project sponsors should pursue incentives to encourage the use of energy efficient equipment and vehicles and promote energy conservation.

E-2 Utilities should increase capacity of existing transmission lines to meet forecast demand that supports sustainable growth, where feasible and appropriate in coordination with local planning agencies.

E-3 Project sponsors should submit projected electricity calculations to the local electricity provider for any project anticipated to require substantial electricity consumption. Any infrastructure improvements necessary should be completed according to the specifications of the electricity provider.

E-4 Project sponsors should include energy analyses in environmental documentation with the goal of conserving energy through the wise and efficient use of energy.

E-5 Project sponsors should evaluate the potential for reducing peak energy demand by encouraging charging of electrical vehicles and other mobile sources during off-peak hours.

E-6 Project sponsors should evaluate the potential for reducing peak energy demand by encouraging the use of catenary or way-side electrical systems developed for transportation systems to operate during off-peak hours.

E-7 Project sponsors should evaluate the potential for reducing peak energy demand by encouraging the use of electrified stationary sources during off-peak hours (e.g., cargo handling equipment).

Remaining Electricity Impacts: The preceding analysis concluded that significant adverse electricity consumption impacts could be created by the proposed project because the potential 2023 electricity usage increase would exceed baseline electricity consumption by 1.5 percent. In spite of implementing the above mitigation measures, electricity consumption impacts would remain significant.

4.3.4.2 Natural Gas

Project-Specific Impacts: Control measures in the 2012 AQMP may result in an increase in demand for natural gas associated with stationary sources due to the need for additional emission controls (e.g., BCM-03, CMB-01, IND-01, FUG-01, MCS-01, INC-01, ADV-01, ADV-02, ADV-03, ADV-04, and ADV-05). Other control measures are expected to encourage the use of natural gas as a fuel to offset the use of petroleum fuels including ONRD-01, ONRD-02, ONRD-03, ONRD-05, ADV-04, and ADV-06. In addition, increased demand for electricity will require additional natural gas, as most of the power plants in California are operated using natural gas.

Total natural gas (utility) consumption in California in 2010 was approximately 4,729 million cubic feet per day with about 36.5 percent of the natural gas consumed in Los Angeles, Orange, Riverside, and San Bernardino counties (see Table 4.3-3). The residential, commercial, industrial, and electrical generation sectors account for approximately 25, 10, 17, and 39 percent, respectively, of total statewide natural gas (utility) consumption. The demand for natural gas in southern California is expected to increase by approximately 0.20 percent from 2010 to 2020[2]. The projected per capita consumption is lower than previously projected because of higher natural gas prices than previously anticipated. Natural gas for vehicle fuel use has steadily grown to where it totaled about 33 million cubic feet per day, which is about, about 0.70 percent of the total statewide natural gas (utility) use (California Gas Report, 2010).

TABLE 4.3-3

Natural Gas (Utility) Impacts for Los Angeles, Orange, Riverside, and San Bernardino Counties (Million Cubic Feet/Year)

NATURAL GAS USE	2010	2020 [a]	2030 [a]
Baseline	1,726	1,730	1,735

Source: California Gas Report, 2012
[a] Projections based on CEC, 2012j

Mobile Sources - According to the CEC, there were about 24,819 light-duty natural gas vehicles and about 11,500 heavy-duty natural gas vehicles in California in 2009 (CEC, 2011). The CEC expects a steady increase in natural gas consumption used as an alternative fuel (see Table 4.3-4), but since there is currently no policy mandate to directly incentivize the production of more natural gas vehicles, penetration of these vehicles in the light-duty sector is relatively low compared to other alternative fuel technologies (CEC, 2012j).

Some of the control measures in the 2012 AQMP could result in an increase in the use of natural gas in medium- and heavy-duty on road vehicles. Expanded use of alternative fuels in medium-duty and heavy-duty trucks using more efficient, advanced natural gas engine

[2] Review of the *2012 California Gas Report*, indicates SoCalGas projects total gas demand to grow at an annual rate of 0.12% from 2011 to 2030. Over the forecast period 2012-2030, demand is expected to exhibit annual decline (of 0.13%) from the level in 2012 due to modest economic growth. However, since the CEC's future natural gas demand provides a conservative analysis and future natural gas demand impacts are concluded to be significant, it is not necessary to revise the analysis.

technologies would be expected to reduce projected diesel-fuel use. Natural gas medium- and heavy-duty vehicles are an attractive environmental option to diesel fueled vehicles because they emit fewer criteria pollutants and toxic components. However, the limited availability of refueling facilities and typically higher vehicle purchase prices has affected the sale of light-duty natural gas fuel vehicles (CEC, 2011). Further, hybrid vehicles and zero emission electric vehicles are further along in the development phase and expected to be the preferred source of power as opposed to natural gas.

TABLE 4.3-4

Projected Petroleum Fuel Displaced with Natural Gas in California

FUEL TYPE	2010	2020
Natural Gas Vehicle Fuel Consumption in California (billion cubic feet)	12.1	16.1
Estimated Natural Gas Vehicle Fuel Consumption in Southern California (billion cubic feet)	9.9	12.8
Petroleum Fuel Displaced in California (million gallons gasoline equivalents)	95.5	127.1
Petroleum Fuel Displaced in Southern California (million gallons gasoline equivalents)	78.2	101.0

Source: California Gas Report, 2012

Stationary Sources - For stationary sources, natural gas is already BACT, so new equipment would already be required to use natural gas. Under the 2012 AQMP control measures, a slight increase in natural gas demand is expected from the use of add-on air pollution controls associated with NOx emission reduction, add-on controls associated with VOC emission reductions, and add-on controls associated with particulate matter control. The amount of natural gas to run these control devices is unknown because the number of equipment required and the equipment sizes are not known. ~~Alternative processing~~ Replacement or retrofitted equipment is expected to be the primary method of control (e.g., the primar~~il~~y method of control for CMB-01 is expected to be new low NOx burners). Low NOx burners ~~which~~ are not expected to result in an increase in natural gas consumption, because this would require replacing one type of burner with a more efficient burner.

Approximately 39 percent of the natural gas consumed in California is used at power plants to generate electricity. Southern California Edison will need to add additional electricity generating capacity to accommodate the increase in population growth. The increased electricity demand expected in the Basin would be generated by natural gas fueled power plants resulting in an increased demand for natural gas, the amount of which is currently unknown.

FUG-01 may result in an increase in natural gas used to combust VOC emissions from vacuum trucks used to remove materials from storage tanks, vessels, sumps, boxes and pipelines. SCAQMD staff estimates that 27 million cubic feet per year of natural gas may be used to combust fugitive VOCs from storage tanks, vessels, sumps, boxes and pipelines pulled by a vacuum truck. The amount of natural gas used to combust fugitive VOCs in FUG-01 would be less than the amount of natural gas reductions expected from other control measures (see Table 4.3-6). The increased demand for an additional 27 million cubic feet per year associated with implementing 2012 AQMP Control Measure FUG-01 would represent an increase in natural gas demand of 1.6 percent compared to the year 2010 natural gas baseline demand of the 1,726 million cubic feet per year. Therefore, the proposed project could be significant for natural gas use.

Project-Specific Mitigation: Mitigation measures are required as potentially significant impacts on natural gas resources associated with the 2012 AQMP have been identified. As individual control measures are promulgated as new rules or rule amendment, mitigation measures will be identified as necessary to ensure that natural gas impacts remain less than significant. Mitigation measures are expected to include the following:

E-8 Project sponsors should pursue incentives to encourage the use of energy efficient equipment and vehicles and promote energy conservation.

E-9 Utilities should increase capacity of existing natural gas lines to meet forecast demand that supports sustainable growth, where feasible and appropriate in coordination with local planning agencies.

E-10 Project sponsors should submit projected natural gas calculations to the local natural gas provider for any project anticipated to require substantial natural gas consumption. Any infrastructure improvements necessary should be completed according to the specifications of the natural gas provider.

E-11 Project sponsors should include energy analyses in environmental documentation with the goal of conserving energy through the wise and efficient use of energy.

E-12 Project sponsors should evaluate the potential for reducing peak energy demand by encouraging the use of natural gas stationary sources during off-peak hours.

Remaining Natural Gas Energy Impacts: The preceding analysis concluded that significant adverse natural gas consumption impacts could be created by the proposed project because natural gas usage would exceed the 2010 natural gas consumption by 1.6 percent. In spite of implementing the above mitigation measures, natural gas consumption impacts would remain significant.

4.3.4.3 Petroleum Fuels

General growth in the district is expected to result in a substantial increase in the use of petroleum fuels between current conditions and 2035. Table 4.3-5 summarizes the expected increases in fuel usage, as predicted by SCAG's transportation and air quality model, between 2011 and 2035 with the investments in the Regional Transportation Plan (RTP) and without the RTP.

TABLE 4.3-5

Projected Transportation Fuel Consumption in Southern California
(thousand gallons per day)

YEAR	FUEL CONSUMPTION	PERCENT INCREASE OVER 2011
2011	16,630	--
2035 (without 2012-2035 RTP/SCS)	20,274	8.8
2035 (with 2012-2035 RTP/SCS)	15,342	-17.6

Source: California Gas Report, 2012

Implementation of the 2012 AQMP is expected to result in a decrease in the future increased demand for petroleum fuels (e.g., diesel, distillate, residual oil, and gasoline) due to mobile source control measures (Tables 4.3-5 and 4.3-6), as well as a potential increase in engine efficiency associated with the retrofit of new engines. Control measures that are expected to result in a decrease in the demand for petroleum fuels include control measures that would result in the installation of new engines in mobile sources, which tend to be more fuel efficient, result in the use of alternative fuels, or result in an increase in electrification of mobile sources, which would eliminate the use of petroleum fuels from mobile sources. Control Measures ONRD-01, ONRD-03, and ONRD-05 are expected to encourage the introduction of about 15,000 zero to partial zero emissions vehicles. The estimated reduction in fuel use is shown in Table 4.3-6. Other control measures that are expected to result in a decrease in petroleum fuel use include OFFRD-01 (repower at least 1,200 locomotive engines with Tier 4 engines using control equipment), OFFRD-03 (replace 30 tier zero locomotives with Tier 4 engines using control equipment), and OFFRD-04 (an additional 25 percent of vessel calls would deploy shorepower technologies or alternative forms of emission reductions). Specific reduction in fuel use from these three control measures, however, is not known at this time. ADV-01 and ADV-02 may result in a decrease in diesel fuel use should "wayside" electrical infrastructure be implemented for specific freeway routes and locomotives (e.g., 300 line haul, 140 switcher, and 52 passenger). The estimated diesel fuel reduction from ADV-01 is not known, however, ADV-02 is estimated to reduce diesel fuel use by 34.7 million gallons per year.

TABLE 4.3-6

Estimated Reduction in Petroleum Fuels Associated with 2012 AQMP Control Measures (gallons per year)

CONTROL MEASURE	2013	2023
ONRD-01 – Incentivize light- and medium-duty trucks (9,000 vehicles) [a]	663,157	5,968,421
ONRD-02 – Accelerated retirement and replacement of pre-1992 light- and medium-duty vehicles (18,000 vehicles) [a]	1,326,315	11,936,842
ONRD-03 – Encourage the introduction of hybrid and zero-emission vehicles (5,000 vehicles) [b]	1,509,091	7,545,455
ADV-02 – Electrification of 492 locomotive engines [c]		34,700,000
Total	**3,498,563**	**60,150,718**

[a] Based on 12,600 miles/year and 19 miles/gallon.
[b] Based on 16,600 miles/year and 11 miles/gallon.
[c] Estimated assuming electrification of locomotives is the selected technology.

Some of the control measures are also expected to result in the installation of retrofit equipment (catalysts, PM traps, etc.) including OFFRD-01, OFFRD-02, and OFFRD-03 Table 4.3-7). These control measures would be expected to result in both reductions as well as increases in petroleum fuel use. An increase in the use of add-on control equipment associated with mobile sources could result in an increase in the use of petroleum fuels because add-on control devices, such as diesel particulate filters, SCRs, catalytic controls, etc., generally result in a decrease in engine efficiency. The use of SCR and diesel particulate filters on construction equipment, for example, could result in an increase in fuel use for the retro-fitted equipment. The amount of additional fuel that would be required would be dependent on the type of control equipment installed and the energy requirement to operate the equipment. However, mobile sources that would have newer engines installed would be expected to result in an increase in efficiency and decrease in fuel use, the amount of which is currently unknown.

Additional diesel fuel may also be required for operational activities under control measures such as FUG-03 - Further ~~VOC~~ Reductions from Fugitive VOC Emissions, which would require additional monitoring and inspection; MCS-02, which may require additional haul trips to remove green waste; and BCM-04, which would require delivery and application of acidifiers. Details of these activities and which facilities may be affected are not known at this time, so the amount of additional diesel fuel cannot be estimated at this time.

TABLE 4.3-7

Off-Road Equipment and Related Control Equipment

CONTROL MEASURE	TYPE OF EQUIPMENT	TYPES OF EMISSION CONTROLS	ASSUMED NUMBER OF UNITS AFFECTED
OFFRD-01	Off-road diesel construction vehicles	SCR, Diesel particulate filters	1,200
OFFRD-02	Freight locomotive (line haul)	SCR, Diesel particulate filters	300
OFFRD-02	Freight locomotive (switcher)	SCR, Diesel particulate filters	140
OFFRD-03	Passenger locomotives	SCR, Diesel particulate filters	52

Construction activities that could be required to implement control measures in the 2012 AQMP would also increase the use of gasoline and diesel, including BCM-03, CMB-01, CMB-02, CMB-03, IND-01, FUG-01, FUG-02, FUG-03, MCS-01, MCS-02, MCS-03, INC-01, ONRD-05, OFFRD-01, OFFRD-05, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06. Construction activities could be required under a number of the control measures to develop transportation infrastructure (e.g., overhead catenary lines), install air pollution control equipment, and further develop electricity to support electrification of sources. The amount of petroleum fuels required would depend on the extent of the specific construction activities. Larger construction projects, which would use the most fuels, are likely to require project specific CEQA review and their specific energy requirements would be evaluated at that time. However, there are currently adequate fuel supplies in California. In fiscal year 2011, 14,728,734,063 gallons of gasoline and 2,564,017,901 gallons of diesel were sold in California (California State Board of Equalization, 2012). Construction activities are temporary and all construction equipment will cease once construction activities are finished. As the use of petroleum fuels in other mobile sources decreases, there is likely to be an excess availability of gasoline and diesel. Implementation of the 2012 AQMP is expected to result in an overall reduction in the use of petroleum fuels (see Table 4.3-6). Therefore, no significant adverse impacts on petroleum fuels are expected due to implementation of the 2012 AQMP.

Emissions from mobile sources are the largest contributors to emissions in the district. Overall, implementation of the 2012 AQMP is expected to result in a large reduction in emissions from mobile sources. Many of the emission reductions associated with the 2012 AQMP are expected to come from mobile sources. In order to achieve the necessary emission reductions, it is expected that a reduction in the use of petroleum fuels would be necessary. Therefore, overall the 2012 AQMP is expected to result in a reduction in the use of gasoline and diesel fuels, because of requirements resulting in higher energy efficiencies or displacement by alternative clean fuels. The largest reductions in use of petroleum-based fuels are expected from the on-road mobile source sector switching to electricity or alternative clean fuels. For on-road mobile sources, the combination of fleet standards for both light- and heavy-duty vehicles, as well as trip reduction measures, produce these large reductions in the use of petroleum-based fuels (see Tables 4.3-4 and 4.3-6). Therefore, implementation of the 2012 AQMP is not expected to result in a significant increase on petroleum fuel use.

Project Specific Mitigation Measure: No significant impacts on petroleum fuels associated with the 2012 AQMP were identified because of anticipated reduction in future demand so that no mitigation measures are required.

Remaining Petroleum Fuel Impacts: Since potential petroleum fuel energy demand impacts are expected to be less than significant and no mitigation measures are required, impacts remain less than significant.4.3.4.4 Alternative Fuels

General growth in the district is expected to result in a substantial increase in the use of petroleum fuels between current conditions and 2035. Table 4.3-5 summarizes the expected increases in fuel usage, as predicted by SCAG's transportation and air quality model, between 2011 and 2035 with the investments in the RTP and without the RTP.

The 2012 AQMP continues to call for progressively lower vehicle emissions through the lowering of vehicle emission standards. These proposed control measures for on- and off-road mobile sources are expected to cause a shift from conventional petroleum fuels to alternative fuels such as CNG and hydrogen. (Please note that the impacts associated with reformulated petroleum fuels (e.g., emulsified diesel fuels and reformulated fuels) are included under the discussion of petroleum fuels as they are predominately comprised of petroleum-based fuels). Control measures that may increase the use of alternative fuels include IND-04, ONRD-03, ONRD-05, OFFRD-01, OFFRD-03, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07.

The use of alternative fuels in California's transportation energy market continues at a gradual pace, but could be limited by a variety of market and regulatory uncertainties. Continuing progress in reducing new gasoline vehicle emissions is having an important effect on auto industry development and marketing of alternative fuel vehicles. The use of cleaner-burning alternative fuels such as CNG is not receiving as much emphasis in light-duty vehicle emission-reducing strategies as previously expected. The combination of gasoline reformulation and advances in automotive emission control technology appears to be making the exhaust emission levels required by California's low-emission vehicle standards achievable without relying on the use of alternative fuels. Therefore, the demand for alternative fuels would depend on their marketing strategies and the development of infrastructure to affect consumer choice.

4.3.4.4.1 Electricity and Natural Gas

The use of electricity and natural gas as alternative fuels for mobile vehicles was discussed in the previous subsections 4.3.4.1 Electricity and 4.3.4.2 Natural Gas.

4.3.4.4.2 Biodiesel

The advantages of biodiesel include decreased net carbon dioxide, hydrocarbon, carbon monoxide, and particulate matter emissions, and fuel properties similar to petroleum diesel for ease of use in diesel engines. Its disadvantages include poorer cold flow characteristics, lower heating values, and mostly reported higher NOx emissions. There are 16 biodiesel production facilities in California with an annual production capacity of 84.5 million gallons. This production capacity is sufficient to supply California's total "proportional share" of biodiesel under the 2007 Renewable Fuel Standard (RFS2) under EISA of 2007. The CEC states that demand for biodiesel may be necessary by obligated parties in California to help achieve compliance with the California Low Carbon Fuel Standard (LCFS) requirements (CEC, 2011). However, to the extent that low and zero emission technologies are implemented as a result of implementing 2012 AQMP control measures, it is likely that biodiesel demand would decline similar to any declines in demand for diesel fuel.

4.3.4.4.3 Ethanol and E85

There are a number of 2012 AQMP control measures that identify alternative fuels as a potential compliance option. Since many of the control measures ultimately call for low or zero emitting equipment it is unclear whether or not ethanol or ethanol blends would be used as a compliance option, but it is assumed that there could be increased demand for ethanol and ethanol blends as combustion fuels.

Currently, most of the ethanol used in California is imported from corn based ethanol plants in the Midwest. There are two facilities in Southern California (one in Carson and one in Colton) that are capable of receiving unit trains of ethanol. Together, they import 672,000 gallons per year of ethanol (CEC, 2011). In addition, there are five corn-based ethanol facilities in California. Three of the five California corn-based ethanol facilities are operating with a collective production capacity of nearly 170 million gallons per year (CEC, 2011). Two of the California facilities remain idle, because of poor economic conditions, with a combined capacity of 71 million gallons per year. All California facilities that are currently idle are assumed to be fully operational at their rated nameplate capacity of nearly 71 million gallons per year beginning January 2013 (CEC, 2011). The potential production capacity, including future ethanol production facilities, for advanced biofuels ethanol production in California is estimated by CEC staff at approximately 502 million gallons per year (CEC, 2011). Based on this information, it is likely that there is sufficient ethanol production capacity to meet any increased demands by 2012 AQMP control measures.

4.3.4.4.4 Methanol and M85

Since M85 is no longer sold in California, M85 is not expected to be affected by AQMP control measures.

4.3.4.4.5 Hydrogen

There is growing interest and financial support for the use of hydrogen-powered fuel cells to power cars, trucks, homes and business. Hydrogen vehicles in California consist of demonstration fuel cell passenger cars, internal combustion engine passenger cars, fuel cell buses, and hybrid fuel cell buses. The California Fuel Cell Partnership, a public-private partnership between interested industry and state and local government agencies, has been leading the coordination of fuel cell vehicle demonstrations in California. To date, 250 hydrogen fuel cell vehicles have been placed on California's roads in demonstration projects (CEC, 2011).

Hydrogen fuel cells are proven technology, but more work is needed to make them cost-effective for use in cars, trucks, homes or businesses. Hydrogen fuel cells create electricity to power cars with minimal pollution. California has been developing the infrastructure of a hydrogen highway, the California Hydrogen Highway Network (CaH2Net). The mission of CaH2Net is to assure that hydrogen fueling stations are in place to meet the demands of fuel cell and other hydrogen vehicle technologies. The first hydrogen station was opened on April 20, 2004 and there are now 23 hydrogen fueling stations in California. Although the specific station numbers originally called for 50 to 100 stations by 2010, there has been a strategic refocusing on putting additional emphasis on creating clusters of hydrogen fueling stations in key urban areas such as Los Angeles and Orange counties, Sacramento, and the San Francisco Bay area (CARB, 2011).

One of the goals of the 2012 AQMP is to shift from conventional petroleum based fuels to less polluting alternative transportation fuels, including hydrogen. Although the 2012 AQMP does not mandate hydrogen fuel use by fleet operators, it does call for further technology demonstration and deployment. Therefore, without regulatory requirements or market incentives, the use of hydrogen fuel in the 2020 timeframe attributable to the 2012 AQMP, increased demand impacts for hydrogen fuel is not expected to be significant.

4.3.4.4.6 Propane (LPG)

There are a number of 2012 AQMP control measures that identify alternative fuels as a potential compliance option. Since many of the control measures ultimately call for low or zero emitting equipment it is unclear whether or not LPG would be used as a compliance option, but it is assumed that there could be increased demand for LPG as combustion fuels. Propane is an unregulated fuel in California (except for storage and safety issues), no data is collected by the state on LPG sales or usage.

Propane vehicle conversions were negatively affected by the EPA's addendum to Memorandum 1A, which led to decreases in the number of vehicle conversions. The supply of propane used in transportation is expected to be sufficient in the near future, both worldwide and in the United States (U.S. DOE, 2010), should LPG-fueled vehicles meet the applicable vehicle tailpipe standards.

Project Specific Mitigation: Based on the above information, potential alternative energy demand impacts are expected to be less than significant so that no mitigation measures are required.

Remaining Alternative Energy Impacts: Since potential alternative energy demand impacts are expected to be less than significant and no mitigation measures are required, impacts remain less than significant.

4.3.4.5 Renewable Energy

A number of 2012 AQMP control measures would encourage the use of clean fuels and alternative fuels or electrification of equipment. For example, Control Measures INC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-05, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06 may result in the use of more electric or hybrid vehicles or equipment.

There are number of different types of renewable energy sources such as wind turbines, windmills, windpumps, or sails; hydroelectric; geothermal; and solar thermal and photovoltaic. No 2012 AQMP control measures were identified that would directly or indirectly adversely affect these renewable sources of electricity. With regard to potential electricity impacts from the 2012 AQMP, refer to subsection 4.3.4.1.

Two control measures may affect biomass/biogas sources: CMB-02 and MCS-02. CMB-02 would require the replacement of existing biogas flares with new biogas flares. The new biogas flares would be more efficient, but would not alter the amount of biogas combusted in the flares. MCS-02 would require that chipped or ground greenwaste be covered to the extent possible. MCS-02 may also require additional best management practices or controls, but is not expected to affect the amount of biomass processed.

California's Renewables Portfolio Standard requires the use of 33 percent renewable energy by 2020. No control measures in the 2012 AQMP would interfere with complying with the renewable energy requirement. Control measures in the 2012 may increase demand for electricity, but this would have no effect on electricity generating sources, either renewable or conventional energy generating sources.

Project Specific Mitigation: Based on the above information, potential renewable energy impacts are expected to be less than significant so that no mitigation measures are required.

Remaining Renewable Energy Impacts: Since potential renewable energy demand impacts are expected to be less than significant and no mitigation measures are required, impacts remain less than significant.

4.3.5 Summary of Energy Impacts

The following is the summary of the conclusions of the analysis of energy impacts associated with implementation of the 2012 AQMP.

- Electricity: Implementation of the 2012 AQMP control measures is expected to result in an overall increase. While this increase is expected to be within the electric generating capacity of the region, an increase in electricity of greater than one percent represents a substantial increase in electricity use. Thus, the energy impacts associated with electricity demand from the implementation of the 2012 AQMP are considered to be significant.
- Natural Gas: The energy impacts associated with implementation of the control measures and strategies in the 2012 AQMP are expected to result in an increase in

natural gas demand. The increased demand for natural gas is considered to be significant.

- Petroleum Fuels: The energy impacts associated with implementation of the control measures and strategies in the 2012 AQMP are expected to result in a reduction in use (less demand) of petroleum fuels so that no significant impacts on petroleum fuels are expected.
- Alternative Fuels: Although an increase in demand for hydrogen as a transportation fuel is expected due to implementation of the control measures and strategies in the 2012 AQMP, this increase is not expected to be significant since hydrogen is not widely available and its use is currently limited. Hydrogen is available or the feedstock that produces it is generally available. Future demand is expected be met through increased production. The energy impacts associated with the future use of hydrogen is expected to be less than the current strategy that uses predominately petroleum based fuels so that no significant hydrogen demand impacts on are expected.
- Renewable Energy: No 2012 AQMP control measures were identified that would adversely affect renewable energy production or interfere with the goals and requirements of the Renewables Portfolio Standard.

Summary of PM2.5 Control Measure Impacts: Energy impacts associated with PM2.5 control measures were evaluated and determined to be less than significant for electricity, natural gas, petroleum fuels, and alternative fuels impacts.

Summary of Ozone Control Measure Impacts: Energy impacts associated with the ozone control measures (22 control measures, see Table 4.3-1) were evaluated and determined to be significant for electricity and natural gas; and less than significant for petroleum fuels, and alternative fuels impacts.

SUBCHAPTER 4.4

HAZARDS AND HAZARDOUS MATERIALS

4.4 HAZARDS AND HAZARDOUS MATERIALS

4.4.1 Introduction

Hazards and hazardous materials impacts are related to the risks of explosions or the release of hazardous substances in the event of an accident or upset conditions. The Initial Study for the 2012 AQMP identified the following types of control measures as having potentially significant hazards and hazardous materials impacts: 1) use of reformulated coatings, solvents, and consumer products; 2) increase in the transportation and disposal of reformulated products; 3) the use of ammonia in selective catalytic reduction (SCR) or selective non-catalytic reduction (SNCR) air pollution control technology; 4) use of alternative fuels; and, 5) use of catalysts.

4.4.2 2012 AQMP Control Measures with Potential Hazards and Hazardous Materials Impacts

The 2012 AQMP continues the air quality management strategy of advancing clean technologies and promoting their use. In particular, some control measures in the 2012 AQMP promote greater use of reformulated low VOC consumer products such as coatings, adhesives, solvents and lubricants, potentially resulting in additional hazards associated with their use while other control measures encourage the use of alternative fuels which could increase hazards associated with the use of these fuels. Each control measure proposed in the 2012 AQMP was evaluated and 24 control measures were identified as having potential adverse hazard impacts. Table 4.4-1 contains a summary of the 2012 AQMP control measures (e.g., three PM2.5 control measures and 21 ozone precursor control measures) which may result in the use of compliance options that could generate significant hazard impacts.

TABLE 4.4-1

Control Measures with Hazards and Hazardous Materials Impacts

Control Measure	Control Measure Title (Pollutant)	Control Methodology	Hazard Impact
SHORT-TERM PM2.5 CONTROL MEASURES			
CMB-01	Further NOx Reductions from RECLAIM (NOx)	Cement kilns, glass furnaces, and gas turbines were not subject to reduction in the 2005 RECLAIM rule amendment. These sources will be examined for further reductions in this control measure and potential rule making. SCR, SNCR, low NOx burners, and NOx reducing additives (catalysts).	Potential exposure to toxic air contaminant (ammonia) associated with SCRs and SNCR during storage, transport, use and accidental release. Potential increase in the quantity of hazardous materials (e.g., catalysts) associated with shipping, handling, storage, use, and disposal.

TABLE 4.4-1(Continued)

Control Measures with Hazards and Hazardous Materials Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	HAZARD IMPACT
SHORT-TERM PM2.5 CONTROL MEASURES			
IND-01	Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities	Environmental lease conditions, port rules, tariffs or incentives.	Use of alternative fuels can result in hazard impacts. Potential exposure to toxic air contaminant (ammonia) associated with SCRs during with storage, transport, use and accidental release.
MCS-01	Application of All Feasible Measures	SCAQMD would adopt and implement new retrofit technology control standards as new BARCT standards become available.	Use of alternative fuels can result in hazard impacts. Potential exposure to toxic air contaminant (ammonia) associated with SCRs during with storage, transport, use and accidental release. Reformulating coatings with more toxic or flammable solvents could cause fire, accidental release, offsite/onsite exposure and worker risk.
OZONE CONTROL MEASURES			
CTS-01	Further VOC Reductions from Architectural Coatings (Rule 1113) (VOC)	Reduce the allowable VOC content in product formulations by using alternative low-VOC products and use application techniques with greater transfer efficiency.	Reformulating coatings with more toxic or flammable solvents could cause fire, accidental release, offsite/onsite exposure and worker risk.
CTS-02	Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants (VOC)	Reduce the allowable VOC content in product formulations by using alternative low-VOC products or non-VOC products/equipment.	Reformulating coatings with more toxic or flammable solvents could cause fire, accidental release, offsite/onsite exposure and worker risk.
CTS-03	Further VOC Reductions from Mold Release Products (VOC)	Limitation of VOC content for mold release products.	Reformulating coatings with more toxic or flammable solvents could cause fire, accidental release, offsite/onsite exposure and worker risk.
CTS-04	Further VOC Reductions from Consumer Products (VOC)	Eliminate or revise the exemption for low vapor pressure solvents in consumer products.	Reformulating consumer products with more toxic or flammable solvents could cause fire, accidental release, offsite/onsite exposure, and worker risk.
FUG-01	~~Further~~ VOC Reductions from Vacuum Trucks (VOC)	VOC control devices such as carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers, liquid scrubbers and positive displacement (PD) pumps.	Hazardous waste from spent carbon, use of ammonia to operate condensers, hazardous waste from operating scrubbers, hazardous waste of spent catalyst from operating thermal oxidizers.

TABLE 4.4-1 (Continued)

Control Measures with Hazards and Hazardous Materials Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	HAZARD IMPACT
OZONE CONTROL MEASURES			
INC-01	Economic Incentive Programs to Adopt Zero and Near-Zero Technologies (NOx)	Installation of cleaner, more efficient combustion equipment, such as boilers, water heaters and commercial space heating or installation of control technologies including fuel cells, diesel particulate filters (DPF), NOx reducing additives (catalysts), alternative electricity generation, such as wind and solar, battery electric, hybrid electric, and usage of low NOx and alternative fuels such as natural gas.	Use of alternative fuels can result in hazard impacts. Potential increase in the quantity of hazardous materials (e.g., catalysts) associated with shipping, handling, storage, use, and disposal.
MCS-03	Improved Start-up, Shutdown and Turnaround Procedures (All Pollutants)	Diverting or eliminating process streams that are vented to flares, and installing redundant equipment to increase operational reliability	Equipment modifications may pose safety issues.
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles (NOx)	Incentives to replace older vehicles with electric or hybrid vehicles.	Use of alternative fuels can result in hazard impacts.
ONRD-03	Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium Heavy-Duty Vehicles (NOx)	Incentives to replace older medium-duty vehicles with low-emitting vehicles. Highest priority would be given to zero-emission vehicles and hybrid vehicles with a portion of their operation in an "all electric range" mode.	Use of alternative fuels can result in hazard impacts.
ONRD-04	Accelerated Retirement of Older Heavy-Duty Vehicles (NOx)	Incentives replace heavy-duty vehicles with newer or new vehicles. Priority would be placed on replacing older diesel trucks in Mira Loma.	Use of alternative fuels can result in hazard impacts.
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards (NOx, PM)	Incentives to replace up to 1,000 heavy-duty vehicles with low-emitting vehicles or zero-emission container movement systems.	Use of alternative fuels can result in hazard impacts.

TABLE 4.4-1 (Continued)

Control Measures with Hazards and Hazardous Materials Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	HAZARD IMPACT
OZONE CONTROL MEASURES			
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment (NOx)	Accelerate Tier 0 and Tier 1 equipment replacement with Tier 4 equipment, use of air pollution control technologies (e.g., advanced fuel injection, air induction, and after-treatment technologies).	Use of alternative fuels can result in hazard impacts.
OFFRD-02	Further Emission Reductions from Freight Locomotives (NOx)	Replace existing engines (Tier 0 and Tier 2 engines) with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Use of alternative fuels can result in hazard impacts. Potential exposure to toxic air contaminant (ammonia) associated with SCRs during storage, transport, use and accidental release.
OFFRD-03	Further Emission Reductions from Passenger Locomotives (NOx)	Repower existing Tier 0 and Tier 2 engines with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Use of alternative fuels can result in hazard impacts. Potential exposure to toxic air contaminant (ammonia) associated with SCRs during storage, transport, use and accidental release.
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels While at Berth (NOx)	Shore power of vessels at berth, use of air pollution control technologies on exhaust gases from auxiliary engines and boilers (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Use of alternative fuels can result in hazard impacts. Potential exposure to toxic air contaminant (ammonia) associated with SCRs during storage, transport, use and accidental release.
ADV-01	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles (NOx)	Construct "wayside" electric or magnetic infrastructure; construct battery charging and fueling infrastructure. Alternatively, if battery, fuel cell or other zero/near zero emission technologies progress sufficiently, the need for wayside power for rail or trucks may be diminished or eliminated.	Use of alternative fuels can result in hazard impacts.
ADV-02	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives (NOx)	Construct "wayside" electric, magnetic, battery-hybrid system, or fuel cell infrastructure, construct battery charging or fueling infrastructure.	Use of alternative fuels can result in hazard impacts.

TABLE 4.4-1 (Concluded)

Control Measures with Hazards and Hazardous Materials Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	HAZARD IMPACT
OZONE CONTROL MEASURES			
ADV-03	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment (NOx)	Construct electric gantry cranes, construct battery charging or fueling infrastructure, and use of alternative fuels.	Use of alternative fuels can result in hazard impacts.
ADV-04	Actions for the Deployment of Cleaner Commercial Harborcraft (NOx)	Construct battery charging or fueling infrastructure, use of air pollution control equipment (e.g., SCR, and use of alternative fuels).	Potential exposure to toxic air contaminant (ammonia) associated with SCRs during storage, transport, use and accidental release.
ADV-05	Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels (NOx)	Employ aftertreatment control technologies such as SCR and sea water scrubbers, and use of alternative fuels.	Potential exposure to toxic air contaminant (ammonia) associated with SCRs during storage, transport, use and accidental release.
ADV-06	Actions for the Deployment of Cleaner Off-Road Equipment (NOx)	Construct battery charging or fueling infrastructure, and increased use of alternative fuels.	Use of alternative fuels can result in hazard impacts.
ADV-07	Actions for the Deployment of Cleaner Aircraft Engines (NOx)	Use alternative fuels, lean combustion burners, high rate turbo bypass, advanced turbo-compressor design, and engine weight reduction.	Use of alternative fuels can result in hazard impacts.

4.4.3 Significance Criteria

Impacts associated with hazards and hazardous materials will be considered significant if any of the following criteria are met:

- Non-compliance with any applicable design code or regulation.
- Non-conformance to National Fire Protection Association standards.
- Non-conformance to regulations or generally accepted industry practices related to operating policy and procedures concerning the design, construction, security, leak detection, spill containment or fire protection.
- Exposure to hazardous chemicals in concentrations equal to or greater than the Emergency Response Planning Guideline (ERPG) 2 levels.

4.4.4 Potential Hazards and Hazardous Materials Impacts and Mitigation Measures

4.4.4.1 Reformulated Coatings, Solvents, and Consumer Products

PROJECT-SPECIFIC IMPACTS: The 2012 AQMP control measures that could require reformulation of coatings, adhesives, solvents, lubricants, mold release agents, and consumer products are MCS-01, CTS-01, CTS-02, CTS-03, and CTS-04. To meet the lowered future VOC content limits, these products are expected to be reformulated. While reformulated products would be expected to have lower VOC contents, the reformulations could have widely varying flammability and health effects, depending on the chemical characteristics of the replacement solvents chosen. While most reformulations are expected to be made with water, which is not flammable and does not have adverse health impacts, other reformulations could be made with an exempt, but extremely flammable solvent, such as acetone. Acetone is an exempt compound from air quality rules and regulations because of its low reactivity. In addition, coatings, solvents and consumer products can also be reformulated with other solvents that are not exempted from the definition of a VOC in SCAQMD's Rule 102, but that also have flammability and health effects issues.

Table 4.4-2 identifies a list of typical conventional solvents and possible replacement solvents that may be used in the manufacture of coatings, adhesives, solvents, lubricants, mold release agents, and consumer products along with their chemical characteristics pertaining to whether each substance is fire hazard.

As illustrated in Table 4.4-2, the flammability classifications by the NFPA are the same for acetone as well as for other conventional solvents that are currently used in existing formulations such as tertiary butyl acetate (T-BAc), toluene, xylene, methyl ethyl ketone (MEK), isopropanol, butyl acetate, and isobutyl alcohol. Because acetone has the lowest flash point of all the chemicals listed, from a flammability perspective, reformulations made with acetone would represent the worst-case. However, it is important to note that acetone also has one of the highest LEL, 2.6 percent by volume, which means that acetone vapors will not cause an explosion unless the vapor concentration exceeds 26,000 ppm.

In contrast, a conventional solvent such as toluene can cause an explosion at 1.3 percent by volume or 13,000 ppm, which poses a much greater risk of explosion when compared to acetone. Similarly, the concentration of xylene, another conventional solvent, that can cause an explosion is even lower than toluene at 1.0 percent by volume or 10,000 ppm. However, facility operators are required to follow operating guidelines when working with flammable chemicals. These guidelines specify well-ventilated areas, as prescribed by the fire department codes, so that it would be difficult to achieve the LEL concentrations when working with flammable chemicals.

TABLE 4.4-2

Chemical Characteristics for Conventional and Potential Replacement Coating Solvents

CAS No.	Chemical Compound	Auto-ignition Temperature (°F)	Boiling Point (@760 mmHg, °F)	Evaporation Rate @ 25 °C (Butyl Acetate = 1)	Flash Point (°F)	LEL/ UEL [a] (% by Vol.)	Vapor Pressure (mmHg @ 20 °C)	NFPA Flammability Rating [b]	Flammability[c]
Conventional Solvents									
67-64-1	Acetone	538	56	6.1	-4	2.6/12.8	180	3	Extremely Flammable
80-05-7	Bisphenol A	N/A	428	N/A	N/A	N/A	N/A	0	N/A
123-86-4	n-Butyl acetate	N/A	257	1	73	1.7/7.6	15	3	Extremely Flammable
111-79-2	2-Butoxyethanol	471.2	340.7	N/A	141.8	1.1/12.7	0.8	2	Combustible
78-92-2	sec-Butyl alcohol	N/A	208	N/A	81	1.7/9.8	11.5	3	Flammable
108-94-1	Cylohexane	788	312.1	N/A	111	1.1/9.4	0.53	2	Combustible
25265-71-8	Diethylene glycol	444	471	N/A	255	1.6/10.8	1	1	Combustible
34590-94-8	Dipropylene glycol methyl ether	278.6	408	N/A	180	1.1/3	0.5	3	Combustible
29911-28-2	Dipropylene glycol monobutyl ether	N/A	441	N/A	205	N/A	0.06	1	Combustible
100-41-4	Ethylbenzene	809.6	276.8	0.84	70	0.8/7	6.75	3	Flammable
103-09-3	2-Ethylhexyl acetate	N/A	390	N/A	185	N/A	N/A	2	Combustible
107-21-1	Ethylene glycol	748	388	0.01	232	3.2/15.3	0.06	1	Combustible
109-59-1	Ethylene glycol isopropyl ether	N/A	109.5	N/A	109	1.6/13	2.6	2	Combustible
50-00-0	Formaldehyde	806	- 2	N/A	147	N/A	N/A	4	Combustible
78-83-1	Isobutyl alcohol	780	226	0.82	82	1.2/10.9	9	3	Flammable
108-21-4	Isopropyl acetate	N/A	109.5	N/A	39	1.8/8	47	3	Flammable
67-63-0	Isopropyl alcohol	399	180	2.3	53	2/12.7	33	3	Extremely Flammable
64742-95-6	Light aromatic hydrocarbons	880	335	0.3	180	0.6/7	11	2	Combustible
110-43-0	Methyl amyl ketone	N/A	301	N/A	106	1.1/7.9	2.14	2	Combustible
78-93-3	Methyl ethyl ketone	474	80	4	16	1.8/11.5	8.7	3	Extremely Flammable
108-10-1	Methyl isobutyl ketone	860	291	0.46	97	1/8.2	5	3	Flammable
107-87-9	Methyl n-propyl ketone	N/A	271.5	N/A	45	1.5/8.2	27	3	Flammable

TABLE 4.4-2 (Continued)

Chemical Characteristics for Conventional and Potential Replacement Coating Solvents

CAS No.	Chemical Compound	Auto-ignition Temperature (°F)	Boiling Point (@760 mmHg, °F)	Evaporation Rate @ 25 °C (Butyl Acetate = 1)	Flash Point (°F)	LEL/ UEL [a] (% by Vol.)	Vapor Pressure (mmHg @ 20 °C)	NFPA Flammability Rating [b]	Flammability[c]
Conventional Solvents									
64741-41-9	Mineral spirits (Stoddard)	232	154-188	0.1	109-113	1.0 / 7	1.1	2	1. Combustible; 2. Special Hazards Labeling per 16 CFR Part 1500.14 (a)(3) & (b)(3)
64742-94-5	Heavy aromatic naphtha	830	719.6	>0.1	145	1.8/11.7	1	2	Combustible
91-20-3	Naphthalene	978.8	424	N/A	176	0.9/5.9	0.03	2	Combustible
8002-05-9	Petroleum distillate (Naphtha)	N/A	86-460	N/A	20 - 100	1.1/5.9	40	3	Extremely Flammable
108-88-3	Toluene	538	111	2	41	1.3/7	22	3	1. Flammable; 2. Special Hazards Labeling per 16 CFR Part 1500.14 (a)(3) & (b)(3)
108-67-8	1,3,5-Trimethylbenzene	550	329	0.01	122	2.6/12.5	2	2	Combustible
95-63-6	1,2,4-Trimethylbenzene	932	337	0.01	112	0.9/6.4	1	2	Combustible
64742-89-8	V.M.&P Naphtha	288	266.9	1.2	53.1	1.2/6	20	3	Flammable
1330-20-7	Xylene	499	139	0.8	81	1.0/6.6	6	3	1. Flammable; 2. Special Hazards Labeling per 16 CFR Part 1500.14 (a)(3) & (b)(3)

TABLE 4.4-2 (Continued)

Chemical Characteristics for Conventional and Potential Replacement Coating Solvents

CAS No.	Chemical Compound	Auto-ignition Temperature (°F)	Boiling Point (@760 mmHg, °F)	Evaporation Rate @ 25 °C (Butyl Acetate = 1)	Flash Point (°F)	LEL/ UEL [a] (% by Vol.)	Vapor Pressure (mmHg @ 20 °C)	NFPA Flammability Rating [b]	Flammability[c]
Potential Replacement Solvents									
67-64-1	Acetone	538	56	6.1	-4	2.6/12.8	180	3	Extremely Flammable
100-51-6	Benzyl alcohol	817	401	0.006	199	1.3/13	0.15	2	Combustible
71-36-3	n-Butanol	N/A	242.5	N/A	95	1.4/11.2	4	3	Flammable
123-86-4	n-Butyl acetate	N/A	257	1	73	1.7/7.6	15	3	Extremely Flammable
85-68-7	Butyl benzyl phthalate	797	698	N/A	390	N/A	8.6E-6	1	Combustible
616-38-6	Dimethyl carbonate	869	194	3.2	64	4.2/12.9	42	3	Flammable
108-01-0	2-Dimethylaminoethanol	455	282	N/A	104	1.6/11.9	3.18	2	Combustible
117-81-7	Dioctyl phthalate	735	446	N/A	405	0.3/	< 0.01	1	Combustible
25265-71-8	Dipropylene glycol	590	449	N/A	250	2.9/12.6	0.03	1	Combustible
763-69-9	Ethyl 3-Ethoxypropionate	N/A	338	N/A	138	N/A	< 1	2	Combustible
141-78-6	Ethyl acetate	800	171	N/A	25	2.2/9	73	3	Extremely Flammable
64-17-5	Ethyl alcohol	685	173	1.4	55	3.3/19	44	3	Extremely Flammable
111-76-2	Ethylene glycol monobutyl ether	460	340	0.07	144	1.1/12.7	0.8	2	Combustible
111-80-5	Ethylene glycol monoethyl ether	455	275	0.41	120	1.7/15.6	4	2	Combustible
109-86-4	Ethylene glycol monomethyl ether	545	256	0.53	100	1.8/19.8	6	2	Combustible
2807-30-9	Ethylene glycol monopropyl ether	455	300	0.22	124	1.3/15.8	1.3	2	Combustible
149-57-5	2-Ethylhexanoic acid	699	442	N/A	244	1/8.6	< 0.01	1	Combustible
822-06-0	Hexamethylene diisocyanate	N/A	415	N/A	284	1/	0.5	1	Combustible
64742-53-6	Hydrotreated light naphthenic distillate	>600	500	N/A	295	N/A	0.04	1	Combustible
79-20-9	Methyl acetate	501	135	5.3	14	3.1/16	173	3	Extremely Flammable
96-29-7	Methyl ethyl ketoxime	N/A	306	N/A	1380	N/A	0.9	2	Combustible
101-68-8	Methylene bisphenyl diisocyanate	464	597	N/A	390	N/A	5E-6	1	Combustible
98-56-6	Parachlorobenzotrifluoride	>500	282	0.9	109	0.9/10.5	5.3	1	Combustible
57-55-6	Propylene glycol	700	370	0.01	210	2.6/12.5	0.08	1	Combustible

TABLE 4.4-2 (Concluded)

Chemical Characteristics for Conventional and Potential Replacement Coating Solvents

CAS No.	Chemical Compound	Auto-ignition Temperature (°F)	Boiling Point (@760 mmHg, °F)	Evaporation Rate @ 25 °C (Butyl Acetate = 1)	Flash Point (°F)	LEL/ UEL [a] (% by Vol.)	Vapor Pressure (mmHg @ 20 °C)	NFPA Flammability Rating [b]	Flammability[c]
Potential Replacement Solvents									
108-65-6	Propylene glycol monomethyl ether acetate	N/A	294	N/A	109	1.1/13.1	2.53	2	Combustible
770-35-4	Propylene glycol phenyl ether	923	469	0.002	239	0.8/6.0	0.01	3	Flammable
1569-01-3	Propylene glycol propyl ether	N/A	302	N/A	118	N/A	N/A	2	Combustible
100-42-5	Styrene	914	293	0.5	88	1.1/6.1	4.5	3	Flammable
540-88-5	Tertiary butyl acetate	N/A	208	2.8	62	1.5 /N/A	N/A	3	Flammable
25265-77-4	Texanol	730	471	< 0.01	248	0.6/4.2	0.01	1	Combustible
26471-62-5	Toluene diisocyanate	1148	478	N/A	250	0.9/9.5	0.025	1	Combustible
121-44-8	Triethylamine	480	194	5.6	16	1.2/8.0	57.1	3	Extremely Flammable
144-19-4	Trimethyl 1,3-pentanediol	572	450	N/A	235	N/A	N/A	1	Combustible

[a] Lower Explosive Limit / Upper Explosive Limit

[b] NFPA Flammability Rating: 0 = Not Combustible; 1 = Combustible if heated; 2 = Caution: Combustible liquid flash point of 100° to 200°F; 3 = Warning: Flammable liquid flash point below 100°F; 4 = Danger: Flammable gas or extremely flammable liquid

[c] The Consumer Products Safety Commission (CPSC) has Labeling and Banning Requirements for Chemicals and Other Hazardous Substances which are located in 15 U.S.C.§1261 and 16 CFR Part 1500. Specifically, the flammability of a product is defined in 16 CFR Part 1500.3 (c)(6) and is based on flash point. For example, a flammable liquid needs to be labeled as: 1) "Extremely Flammable" if the flash point is below 20 °F; 2) "Flammable" if the flash point is above 20 °F but less than 100°F; or, 3) "Combustible" if the flash point is above 100 °F up to and including 150 °F.

While a "worst-case" flammability scenario could be that all of the affected 2012 AQMP coatings, solvents and consumer products would be reformulated with acetone to meet the interim and final VOC content limits, due to lower costs, most future reformulated products will likely be reformulated using primarily water. Water-based coatings are generally not flammable and typically have a lower NFPA classification, and a lower CPSC classification, when compared to coatings formulated with conventional solvents.

Chemistry classes at all levels from grade school to universities, as well as industrial laboratories, use acetone for wiping down counter tops and cleaning glassware. Additional uses for acetone include solvent for paint, varnish, lacquers, inks, adhesives, floor coatings, and cosmetic products including nail polish and nail polish remover. Further, it is currently used widely in coating and solvent formulations.

Labels and MSDSs accompanying acetone-based products caution the user regarding acetone's flammability and advise the user to "*keep the container away from heat, sparks, flame and all other sources of ignition. The vapors may cause flash fire or ignite explosively. Use only with ventilation*." All of the large coating manufacturers currently offer pure acetone for sale with similar warnings. The Uniform Fire Code (UFC) treats solvents such as acetone, butyl acetate, and MEK as Class I Flammable Liquids. Further, the UFC considers all of these solvents to present the same relative degree of fire hazard (SCAQMD, 2003).

A list of conventional and potential replacement solvents and their related health hazards information are shown in Table 4.4-3. As illustrated in Table 4.4-3, some of the potential replacement solvents have lower or less severe TLVs, PELs, IDLHs than some of the conventional solvents. For example, acetone would be considered to have less health hazards than all of the conventional solvents listed. However, there are some replacement solvents that could have higher, more severe, or unknown toxicological effects. For example, the diisocyanate group of solvents appear to have more severe toxicological effects than the listed traditional solvents.

In addition to the health hazard values summarized in Table 4.4-3, there are several chemicals listed that are toxics, identified as TACs, including but not limited to the following: ethylbenzene, formaldehyde, methyl ethyl ketone (MEK), methyl isobutyl ketone (MIBK), toluene, triethylamine, and xylene. The use of materials that contain toxic compounds is of particular concern, in both existing formulations as well as reformulated products, to the SCAQMD and other agencies such as EPA, CARB, OSHA, and the Office of Environmental Health Hazard Assessment (OEHHA) (which is part of the California Environmental Protection Agency (Cal/EPA)), because some of the TACs used in some coatings are considered carcinogens (cancer-causing) such as formaldehyde while others may have other non-cancer health effects[1].

[1] Formaldehyde, toluene, triethylamine, and xylene are classified as having both chronic and acute health effects; ethylbenzene as having chronic health effects and zinc oxide proposed as having chronic health effects; MEK as having acute health effects with future proposed risk value for chronic; and, cobalt compounds as having future proposed risk values. In addition, MIBK is classified by EPA as a HAP, but the toxicology assessment is not finalized.

TABLE 4.4-3

Health Hazards of Conventional and Potential Replacement Solvents

CAS No.	Chemical Compound	NFPA Health Rating [a]	TLV (ACGIH)[b] (ppm)	PEL (OSHA) [c] (ppm)	IDLH (NIOSH)[d] (ppm)	Health Effects
Conventional Solvents						
67-64-1	Acetone	1	500	1,000	2,500	Mild irritation - eye, nose, throat, skin; narcosis
80-05-7	Bisphenol A	2	N/A	N/A	N/A	Mild irritation - eyes and skin
123-86-4	n-Butyl acetate	2	150	150	1,700	Moderate irritation – eye, nose, throat; narcosis
111-79-2	2-Butoxyethanol	1	20	50	5	Mild irritation - eyes, skin and respiratory
78-92-2	sec-Butyl alcohol	2	100	150	2,000	Mild irritation - eye, nose, throat, skin; narcosis
108-94-1	Cyclohexane	2	20	50	700	Moderate irritation- eye, skin, nose and throat
25265-71-8	Diethylene glycol	1	N/A	N/A	N/A	Mild irritation - eyes and skin
34590-94-8	Dipropylene glycol methyl ether	0	100	100	100	Mild irritation – eye, skin, respiratory, digestion
29911-28-2	Dipropylene glycol monobutyl ether	1	N/A	N/A	N/A	Potential severe irritation to eyes, nose and throat; moderate skin and digestion irritation
100-41-4	Ethylbenzene	2	100	100	800	Moderate irritation – eye, skin, nose, throat
103-09-3	2-Ethylhexyl acetate	2	N/A	N/A	N/A	Mild irritation – eye, skin, respiratory, digestion
107-21-1	Ethylene glycol	2	100	50	N/A	Mild irritation – respiratory, skin, kidney, reproductive
109-59-1	Ethylene glycol isopropyl ether	2	25	25	N/A	Mild irritation – eye, skin, respiratory, digestion
50-00-0	Formaldehyde	3	0.30	1	0.016	Irritation - skin, eyes, nose, and throat. High levels of exposure may cause some types of cancers.
78-83-1	Isobutyl alcohol	1	50	100	8,000	Mild irritation – eye, nose, throat; suspect carcinogen
108-21-4	Isopropyl acetate	1	100	250	1,800	Mild irritation – eye, skin, nose, throat
67-63-0	Isopropyl alcohol	1	200	400	2,000	Mild irritation – eyes, nose, throat; narcosis
64742-95-6	Light aromatic hydrocarbons	2	10-100	10-100	25-100	Mild irritation – eye, skin, respiratory, digestion
110-43-0	Methyl amyl ketone	1	50	100	100	Mild irritation - eyes and skin
78-93-3	Methyl ethyl ketone	1	200	200	3,000	Mild irritation – eye, nose, throat; narcosis; skin
108-10-1	Methyl isobutyl ketone	2	50	50	50	Potential serious eye irritation; mild skin and respiratory irritation
107-87-9	Methyl n-propyl ketone	2	150	200	150	Moderate irritation – eye, skin, respiratory

TABLE 4.4-3 (Continued)

Health Hazards of Conventional and Potential Replacement Solvents

CAS No.	Chemical Compound	NFPA Health Rating [a]	TLV (ACGIH)[b] (ppm)	PEL (OSHA) [c] (ppm)	IDLH (NIOSH)[d] (ppm)	Health Effects
Conventional Solvents						
64741-41-9	Mineral spirits (Stoddard)	1	100	500	5,000	Narcosis; mild irritant
64742-94-5	Heavy aromatic naphtha	2	N/A	N/A	N/A	Mild irritation – eye, skin, respiratory, digestion
91-20-3	Naphthalene	4	10	10	10	Moderate irritation - eye, skin; fatal if inhaled
8002-05-9	Petroleum distillate (Naphtha)	1	400	500	1,100	Mild irritation; narcosis
108-88-3	Toluene	2	50	200	500	Moderate irritation – eye, nose, throat; narcosis; skin; suspect teratogen; mutagen, nervous system
108-67-8	1,3,5-Trimethylbenzene	2	25	25	25	Mild irritation - skin, eye; harmful if inhaled
95-63-6	1,2,4-Trimethylbenzene	2	25	25	25	Mild irritation - skin; serious irritation- eye; harmful if inhaled
64742-89-8	V.M.&P Naphtha	1	300	500	N/A	Mild irritation - skin, eye
1330-20-7	Xylene	2	100	100	1,000	Mild irritation – eye, nose, throat; narcosis; skin
Potential Replacement Solvents						
67-64-1	Acetone	1	500	1,000	2,500	Mild irritation - eye, nose, throat, skin; narcosis
100-51-6	Benzyl alcohol	2	N/A	N/A	N/A	Mild irritation - skin, respiratory; severe eye and ingestion irritation
71-36-3	n-Butanol	2	20	100	1,400	Potential severe irritation to eyes, nose and throat; moderate skin, digestion and respiratory irritation
123-86-4	n-Butyl acetate	2	150	150	150	Mild irritation - skin, eye, respiratory, digestion
85-68-7	Butyl benzyl phthalate	1	N/A	N/A	N/A	Mild irritation - eye, nose, throat, skin
108-01-0	2-Dimethylaminoethanol	3	N/A	N/A	N/A	Potential severe irritation to eyes, skin, throat and digestion; high risk to unborn child
616-38-6	Dimethyl carbonate	0	N/A	N/A	N/A	Mild irritation - respiratory, skin, eye, digestive
117-81-7	Dioctyl phthalate	0	N/A	N/A	N/A	Mild irritation - respiratory, skin, eye, digestive
25265-71-8	Dipropylene glycol	1	N/A	N/A	N/A	Mild irritation - respiratory, skin, eye, digestive, nausea, dizziness; may cause liver and kidney damage
763-69-9	Ethyl 3-Ethoxypropionate	1	0.3	N/A	0.01	Mild irritation - respiratory, skin, eye, digestive

TABLE 4.4-3 (Continued)

Health Hazards of Conventional and Potential Replacement Solvents

CAS No.	Chemical Compound	NFPA Health Rating [a]	TLV (ACGIH)[b] (ppm)	PEL (OSHA) [c] (ppm)	IDLH (NIOSH)[d] (ppm)	Health Effects
Potential Replacement Solvents						
141-78-6	Ethyl acetate	1	400	400	400	Mild irritation - respiratory, skin, eye, digestive; may cause acute inhalation
64-17-5	Ethyl alcohol	2	1,000	1,000	1,000	Mild irritation - respiratory, skin, eye, digestive
111-76-2	Ethylene glycol monobutyl ether	2	20	50	700	Mild irritation – eye, nose, throat; anemia; skin
111-80-5	Ethylene glycol monoethyl ether	2	5	200	500	Cumulative blood damage; moderate irritation of eyes, throat, skin
109-86-4	Ethylene glycol monomethyl ether	2	5	25	N/A	Cumulative CNS; skin; suspect reproductive effects; blood disorders
2807-30-9	Ethylene glycol monopropyl ether	2	N/A	N/A	N/A	Mild irritation - eye, nose, skin, respiratory, digestive
149-57-5	2-Ethylhexanoic acid	2	N/A	N/A	N/A	Mild irritation - eye, nose, skin, respiratory, digestive
822-06-0	Hexamethylene diisocyanate	4	0.005	N/A	0.005	Potential fatality if inhaled; moderate skin, eye irritation; toxic if swallowed
64742-53-6	Hydrotreated light naphthenic distillate	1	N/A	N/A	N/A	Mild irritation - eye, skin, respiratory, digestive
79-20-9	Methyl acetate	2	200	200	200	Mild irritation - eye, nose, skin, respiratory, digestive
96-29-7	Methyl ethyl ketoxime	2	N/A	N/A	N/A	Mild irritation - eye, nose, skin, respiratory, digestive
101-68-8	Methylene bisphenyl diisocyanate	3	0.01	0.02	40	Mild irritation – respiratory
98-56-6	Parachlorobenzotrifluoride	2	N/A	N/A	N/A	Mild irritation - eye, nose, respiratory, digestive
57-55-6	Propylene glycol	0	100	100	N/A	Mild irritation – slight eye, anesthesia
108-65-6	Propylene glycol monomethyl ether acetate	1	N/A	N/A	N/A	Mild irritation - eye, nose, skin, respiratory, digestive
770-35-4	Propylene glycol phenyl ether	2	N/A	N/A	N/A	Mild irritation - eye, nose, skin, respiratory, digestive
1569-01-3	Propylene glycol propyl ether	2	N/A	N/A	N/A	Mild irritation - eye, nose, skin, respiratory, digestive
100-42-5	Styrene	2	20	100	5,000	Mild irritation – eye, respiratory, neurotoxicity

TABLE 4.4-3 (Concluded)

Health Hazards of Conventional and Potential Replacement Solvents

CAS No.	Chemical Compound	NFPA Health Rating [a]	TLV (ACGIH)[b] (ppm)	PEL (OSHA) [c] (ppm)	IDLH (NIOSH)[d] (ppm)	Health Effects
Potential Replacement Solvents						
540-88-5	Tertiary butyl acetate	2	200	200	200	Mild irritation - eye, nose, skin, respiratory, digestive; prolonged exposure may cause dermatitis, blood effects, central nervous system and kidney problems
25265-77-4	Texanol	1	N/A	N/A	N/A	Mild irritation - eye, nose, skin, respiratory, digestive
26471-62-5	Toluene diisocyanate	3	0.005	0.02	10	Mild irritation – respiratory
121-44-8	Triethylamine	3	1	25	200	Mild irritation - eye; Cumulative eye, respiratory, and hematological effects.
144-19-4	Trimethyl 1,3-pentanediol	0	N/A	N/A	N/A	Mild irritation - eye, nose, skin, respiratory, digestive

[a] NFPA Health Rating: 0 = No unusual hazard; 1 = Caution: May be irritating; 2 = Warning: May be harmful if inhaled or absorbed; 3 = Warning: Corrosive or toxic. Avoid skin contact or inhalation; 4 = Danger: May be fatal on short exposure. S pecialized protective equipment required.

[b] TLV = Threshold Limit Value, a recommended guideline established by the American Conference of Governmental Industrial Hygiene (ACGIH)

[c] PEL = Permissable Expo~~ru~~sure Limit, established by OSHA

[d] IDLH = Immediately Dangerous to Life and Health, established by NIOSH

For these reasons, there are two local rules that regulate TAC emissions in coatings: SCAQMD Rule 1401 – New Source Review of Toxic Air Contaminants, and SCAQMD Rule 1402 – Control of Toxic Air Contaminants From Existing Sources. Rule 1401 applies to new and modified facilities, including coating facilities, and Rule 1402 applies to facility-wide risk at existing facilities. Since the majority of coating facilities located within SCAQMD's jurisdiction are existing sources, the requirements in Rule 1402 are the main drivers for reducing overall risk and, therefore, TAC emissions from this industry.

For reasons of cost and to provide flexibility with stringent coating VOC content requirements the SCAQMD has received requests to exempt two chemicals from the definition of a VOC in SCAQMD's Rule 102: tertiary butyl acetate (T-Bac) and dimethyl carbonate (DMC). T-BAc is not currently identified in any of SCAQMD's rules as a TAC. T-BAc has been delisted as a VOC by the U.S. EPA[2], but it has not been delisted as a VOC by CARB or the SCAQMD. When delisting a compound from the definition of VOC, EPA only considers reactivity and does not address whether the compound is toxic or has global warming of stratospheric ozone depleting potential. T-BAc is not currently classified as a hazardous air pollutant under the federal Clean Air Act. T-BAc possesses a low photochemical reactivity as well as some other physical and chemical properties that are considered desirable by its manufacturer's representatives. However, T-BAc may be unsuitable for consideration as a potential replacement for all conventional solvents because of T-BAc's potential toxicity. Specifically, T-BAc has the potential to form a metabolite called tert-butyl alcohol (TBA) which has cancer potency and acute noncarcinogenic values established by OEHHA. According to Acute Toxicity and Cancer Risk Assessment Values for TBA, (Budroe, et al., 2004), "TBAc should be considered to pose a potential cancer risk to humans because of the metabolic conversion to TBA."

Under limited and prescribed circumstances, the SCAQMD incorporated limited use exemptions for T-BAc into SCAQMD Rules 1113 - Architectural Coatings, and 1151 - Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations) to provide potential compliance flexibility while limiting use of T-BAc because of the potential toxics concerns.

DMC is also not currently identified in any of SCAQMD's rules as a TAC. EPA revised the federal VOC definition to exclude DMC based on its negligible photochemical reactivity[3]. DMC is also currently not identified as a HAP under the federal Clean Air Act nor is it classified as an ozone depleting substance. No exposure guidelines have been established for DMC by the American Conference of Governmental Industrial Hygienists (ACGIH), or by the National Institute for Occupational Safety and Health (NIOSH). DMC is of concern because it forms a metabolite (an intermediate product of metabolism) consisting of methanol, which is a carcinogen.

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2 U.S. EPA. 2004. Revision to Definition of Volatile Organic Compounds – Exclusion of t-Butyl Acetate, 40 CFR Part 51, Federal Register 69298, November 29, 2004. (http://www.gpo.gov/fdsys/pkg/FR-2004-11-29/pdf/04-26069.pdf)

3 U.S. EPA. 2009. Air Quality: Revision to Definition of Volatile Organic Compounds- Exclusion of Propylene Carbonate and Dimethyl Carbonate, 40 CFR Part 51, Federal Register 3437, January 21, 2009. (http://www.gpo.gov/fdsys/pkg/FR-2009-01-21/pdf/E9-1150.pdf

Thus, when coatings and other products are reformulated as part of implementing the various control measures proposed in the 2012 AQMP, manufacturers could potentially use replacement chemicals that could pose new or different health risks, but SCAQMD Rule 1401 and 1402 would limit potential exposures to nearby receptors. Further, as was the case with the limited use exemption of T-Bac in Rules 1113 and 1151, future SCAQMD rulemaking would require individual evaluation of replacement chemicals that could pose health risks.

When comparing the conventional solvents listed in Table 4.4-3, some of the replacement solvents (e.g., triethylamine) are likely to be present in trace amounts and accidental releases would be considered a one-time event that would be neutralized and cleaned up before all the solvent has evaporated, so no new chronic health risk is expected. As shown in Table 4.4-3, the toxicity of replacement materials is generally less or no worse than conventional solvents overall but if a facility changes from using water-based products to using products that are reformulated with chemicals that may have new or different health hazards, significant adverse health hazard impacts could occur from using some low VOC reformulated products. However, as with the use of all chemicals, facilities and their workers would be required to continue to comply with existing health protective procedures when handling both flammable and toxic materials. In addition, any increase in the future use of low VOC compliant coating materials that are reformulated with water would be expected to result in a concurrent reduction in the number of accidental releases of high VOC coating materials. As a result, the net number of accidental releases would be expected to remain constant, allowing for population growth in southern California.

Regarding fire hazards, if manufacturers use solvents such as Texanol, propylene glycol, etc., in future compliant water-borne coatings, significant adverse hazard impacts would not be expected to occur because in general these solvents are either equivalent or less flammable solvent per the NFPA ratings. However, if manufacturers reformulate with acetone, then more acetone-based (and extremely flammable) products would be on the market. Similarly, if manufacturers reformulate with products that have increased flammability than products manufactured with conventional solvents, consumers who may be used to a higher VOC product with lower flammability, may be unaware that the reformulated products may have chemicals with increased flammability and an increased risk when used.

Lastly, in general, water-based coatings and products tend to contain less flammable and less toxic materials than solvent-based coatings and products. While the continued and potentially increased use of waterborne coatings and products would generally be expected to reduce the overall hazard impacts associated with solvent-based products, a switch from currently using water-based products to reformulated solvent-based products could offset any reduction realized. Without knowing how many facilities currently using water-based products would switch to using reformulated solvent-based products as a result of implementing the 2012 AQMP control measures, significant impacts on fire hazards associated with reformulated coatings, solvents and consumer products could occur. Therefore, hazards and hazardous materials impacts associated with increased flammability of potential replacement solvents are concluded to be significant.

PROJECT-SPECIFIC MITIGATION: Since hazards and hazardous materials impacts associated with increased flammability of potential replacement solvents, reformulated coatings and consumer products were identified, the following mitigation measures are necessary and required as part of future rule development pertaining to reformulated products:

HZ-1: Add consumer warning requirements for all flammable and extremely flammable products; and,

HZ-2: Add requirements to conduct a public education and outreach program in joint cooperation with local fire departments regarding flammable and extremely flammable products that may be included in consumer paint thinners and multi-purpose solvents.

REMAINING IMPACTS: The fire hazard impacts are expected to be significant prior to mitigation. While the SCAQMD cannot predict which coatings, solvents and consumer products each affected facility might choose to use in the future as reformulations become available, the mitigation measure is expected to be effective at informing consumers about the potential fire hazards associated with reformulated products. Thus, after mitigation, no remaining significant impacts on fire hazards are expected.

4.4.4.2 Use of Alternative Fuels

The 2012 AQMP would establish in-use strategies that may require or promote the use of alternative fuels including Control Measures IND-01, INC-01, ONRD-01, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07. Control Measure IND-01 is the only control measure developed for PM2.5 emission reductions and the rest of the control measures were developed for ozone precursor reductions. Use of alternative fuels in place of conventional fuels may present a potential safety issue due to the increased transport, use and handling of alternative fuels. All fuels are flammable; therefore, their use could result in increased hazards associated with their transport and use.

4.4.4.2.1 Methanol/Methanol Blends

Methanol or methyl alcohol is a clear colorless liquid which is commercially manufactured from natural gas in the U.S. At its peak, nearly six million gasoline gallon equivalents of methanol blends were used annually in alternative fuel vehicles in the U.S. Methanol use in vehicles has declined dramatically since the early 1990s, and automakers no longer manufacture methanol vehicles (DOE, 2012).

Methanol is often designated at M100, which is 100 percent methanol, or M85, which are 85 percent methanol and 15 percent gasoline. Pure methanol has low flame luminosity, making it difficult to see fires, particularly in daylight. However, the addition of gasoline to M85 increases both the luminosity and the fuel volatility. The increased luminosity produces a visible flame, and the latter effect generally makes the vapors present in the fuel tank too rich to be flammable.

The bulk transfer of methanol is usually done in standard petroleum tanker trucks. There is no reason to expect that methanol transport will be more dangerous than gasoline or diesel transport. There are, however, certain physical properties of methanol that must be addressed during transport and storage when compared to gasoline or diesel. First, methanol (M100 and M85) is incompatible with several types of materials typically used in petroleum storage and transfer systems. Therefore, it is necessary to take special precautions in selecting material for these purposes. Second, pure methanol (M100) vapor/air mixtures at ambient temperatures and pressures can create a flammable mixture in the ullage space of a storage tank. Therefore, it is important to ensure that there are strong safeguards against any ignition sources inside tanks and that vent lines or other openings have flame arrestors. Furthermore, any fill lines must extend below the liquid methanol level to provide a seal between an external ignition source and the vapor/air mixture in the tank. M85 vapors are primarily composed of gasoline, and should not change the fire hazard of transfer and storage relative to gasoline (DOT, 1995).

Methanol has been used for car racing in the U.S. The main reason for this choice was its safety compared to gasoline. Methanol is harder to ignite, creates less radiant heat, can be controlled/extinguished with water, and burns without producing black smoke, facilitating rescue. For regular driving, methanol offers a substantial decrease in the risks of fuel fire deaths compared to gasoline for the same reasons as in racing. For M100 a 90 percent reduction in fuel related automotive fires is projected, while a smaller reduction of 40 percent is projected for M85 (MIT, 2010).

PROJECT-SPECIFIC IMPACTS - METHANOL: Compared with diesel fuel and gasoline the following can be stated with respect to methanol:

- Diesel fuel and gasoline contain components that are considerably more hazardous than methanol. For example, diesel fuel contains highly toxic polynuclear aromatic hydrocarbons (PAHs) and gasoline contains an array of toxic compounds, including benzene, a known carcinogen;

- Diesel fuel and gasoline vapors are heavier than air (for a specific gravity of air =1, gasoline is 3.4 and diesel is greater than 4). Methanol is heavier than air but lighter (specific gravity is 1.11) than gasoline and diesel fuel and disperses more readily in air than gasoline or diesel fuel;

- Methanol has a higher auto ignition temperature (793 degrees Fahrenheit [^{o}F]) than diesel fuel (500 ^{o}F) or gasoline (500 ^{o}F);

- Methanol is more difficult to ignite since it has a "lower flammability limit" that is higher (5.5 percent) than gasoline (approximately one percent) or diesel fuel (0.5 percent);

- Unlike gasoline, methanol can ignite in enclosed spaces such as fuel tanks since its upper flammability limit is 15 percent and it is slightly heavier than air. For gasoline in a confined space, the vapor concentration exceeds the higher flammability limit (7.6 percent) and is therefore too high to ignite in the tank. Modifications such as materials inside the fuel tank that can arrest and quench flame propagation and modifications to isolate the tank from sparks and ignition sources are required to avoid ignition in the fuel tanks; and,

- In case of fire, methanol can be extinguished with water while water on gasoline or diesel fuel spreads the fire.

In 2005 California stopped the use of methanol after 25 years and 200,000,000 miles of operation. There are currently no fueling stations in the state. Although there is still some interest in methanol as a vehicle fuel, there is great emphasis on research and development of other alternative fuels. Consequently, it is not expected that methanol use will increase substantially.

PROJECT-SPECIFIC MITIGATION - METHANOL: Less than significant impacts on hazards associated with the use of methanol as an alternative fuel are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS - METHANOL: The hazard impacts associated with using methanol as an alternative fuel are expected to be less than significant. Thus, no remaining hazard impacts associated with methanol use are expected.

4.4.4.2.2 Ethanol/Ethanol Blends

Like methanol, ethanol is a clear colorless organic liquid with physical and chemical properties which do not change from source to source like conventional fuels. In the U.S., ethanol is typically produced from corn or other grain products, while some imported ethanol is produced from sugar cane. For commercial or industrial use, pure ethanol (E100) is usually denatured with a small amount of gasoline or similar substance to avoid federal alcoholic beverage tax and intentional ingestion. Heavy duty vehicles use E95 (95 percent ethanol and five percent gasoline) or E93 (93 percent ethanol, five percent methanol, and two percent kerosene). Light and medium duty vehicles use E85 (85 percent ethanol and 15 percent gasoline). Vapors from ethanol blended fuels will exhibit similar flammability characteristics as gasoline. There are currently 48 E85 fueling stations that are open to the public in California (U.S. DOE, 2012).

The bulk transfer of ethanol is usually done in standard petroleum tanker trucks. Since the NFPA classification of ethanol is the same as gasoline or diesel (Class IB flammable liquid), there is no reason to expect that ethanol transport will be more dangerous than gasoline or diesel transport. There are, however, certain physical properties of ethanol that must be addressed during transport and storage when compared to gasoline or diesel. First, ethanol is incompatible with some types of materials used in petroleum storage and transfer systems; therefore, it is necessary to take some precaution to assure ethanol capable materials are used. Second, like M100, E100 vapor/air mixtures at ambient temperatures and pressures can create a flammable mixture in the ullage space of a storage tank. Therefore, it is important to ensure that there are strong safeguards against any ignition sources inside tanks and that vent lines or other openings have flame arrestors. Furthermore, any fill lines must extend below the liquid ethanol level to provide a seal between an external ignition source and the vapor/air mixture in the tank. Ethanol blended fuel vapors are primarily composed of gasoline, and should not change the fire hazard of transfer and storage relative to gasoline (DOT, 1995).

PROJECT-SPECIFIC IMPACTS – ETHANOL/ETHANOL BLENDS: Compared with diesel fuel and gasoline the following can be stated with respect to ethanol:

- Diesel fuel and gasoline contain components that are considerably more hazardous than ethanol. For example, diesel fuel contains highly toxic polynuclear aromatic hydrocarbons (PAHs) and gasoline contains an array of toxic compounds, including benzene, a known carcinogen;

- Diesel fuel and gasoline vapors are heavier than air (for a specific gravity of air =1, gasoline is 3.4 and diesel is greater than 4). Ethanol is heavier than air but lighter (specific gravity is 1.6) than gasoline and diesel fuel and disperses more readily in air than gasoline or diesel fuel;

- Ethanol has a higher auto ignition temperature (684 degrees Fahrenheit [^{o}F]) than diesel fuel (500 ^{o}F) or gasoline (500 ^{o}F);

- Ethanol is more difficult to ignite since it has a "lower flammability limit" that is higher (3.3 percent) than gasoline (approximately one percent) or diesel fuel (0.5 percent);

- Unlike gasoline, ethanol can ignite in enclosed spaces such as fuel tanks since its upper flammability limit is 15 percent and it is slightly heavier than air. For gasoline in a confined space, the vapor concentration exceeds the higher flammability limit (7.6 percent) and is therefore too high to ignite in the tank. Modifications such as materials inside the fuel tank that can arrest and quench flame propagation and modifications to isolate the tank from sparks and ignition sources are required to avoid ignition in the fuel tanks; and,

- In case of fire, ethanol can be extinguished with water while water on gasoline or diesel fuel spreads the fire.

Based upon the preceding information, hazards associated with ethanol are approximately equivalent or less compared to conventional fuels. Therefore, increased usage of ethanol with a concurrent decline in usage of conventional fuels will not significantly alter existing hazards associated with mobile source fuels. Consequently, increased usage of ethanol is not expected to generate significant adverse hazard impacts.

PROJECT-SPECIFIC MITIGATION – ETHANOL/ETHANOL BLENDS: Less than significant impacts on hazards associated with the use of ethanol or ethanol blends as an alternative fuel are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS – ETHANOL/ETHANOL BLENDS: The hazard impacts associated with using ethanol and ethanol blends as an alternative fuel are expected to be less than significant. Thus, no remaining hazard impacts associated with ethanol and ethanol blend use are expected.

4.4.4.2.3 Compressed Natural Gas (CNG)

Natural gas is a mixture of hydrocarbons, mainly methane, that are in gaseous form at ambient temperature and pressure. It is also odorless and tasteless; therefore, an odorant is added so personnel in the vicinity of a leak can detect the presence of natural gas before it has reached the flammability limit in the area. Unlike other alternative fuels, natural gas already has an extensive distribution system and supply network. The issues of bulk transfer and storage are very different from other fuels, which are usually transported via tanker truck. CNG is generally produced onsite using compressors fed from a nearby natural gas pipeline. The typical range of methane in pipeline quality natural gas is approximately 80 to 95 percent. However, CARB has specified that the methane content to be greater than 88 percent for vehicular grade CNG. Typical on-board pressures for CNG range from 3,000 to 3,600 pounds per square inch gauge (psig) (DOT, 1995). There are currently 140 CNG refueling stations that are open to the public in California, and a few manufactures offer home refueling options (U.S. DOE, 2012).

The SCAQMD has had a history of promoting the use of CNG in the past and few issues have arisen from the transport of CNG, as most refueling applications have relied on the existing natural gas pipeline infrastructure. Furthermore, CNG compositions and storage cylinders in vehicles follow NFPA 52 (CNG Vehicular Fuel Systems) and Society of Automotive Engineers (SAE) J1616 (Recommended Practice for CNG Fuel) specifications. These specifications limit the potential hazards related to CNG leaks related to fuel storage and use in vehicles. Furthermore, natural gas has a higher flammability limit (five percent) than gasoline (one percent) or diesel (0.5 percent). Natural gas also has a lower ignition temperature (1,200 ^{o}F) than gasoline or diesel (500 ^{o}F). Other hazards associated with compressed fuels are projectiles from openings and freeze burns from rapid vaporization.

The main additional hazard associated with the use of CNG versus conventional fuels is the exposure to high pressures employed during storage, dispensing and operations. Due to these high pressures a large amount of gas could escape in a short amount of time and, if present under flammable conditions, could explode in the presence of an ignition source. Another potentially significant hazard is a release of natural gas during vehicle maintenance (DOT, 1995).

PROJECT-SPECIFIC IMPACTS - CNG: Compared with diesel fuel and gasoline the following can be stated with respect to CNG:

- Diesel fuel and gasoline are toxic to the skin and lungs while CNG is not;

- Diesel fuel and gasoline vapors are heavier than air (for specific gravity of air =1, gasoline is 3.4 and diesel fuel is >4). CNG is lighter than air (specific gravity is 0.55) and disperses more readily in air;

- CNG has a higher auto ignition temperature (1,200 ^oF) than diesel fuel (500 ^oF) or gasoline (500 ^oF);

- CNG is more difficult to ignite since it has a “lower flammability limit” that is higher (5.3 percent) than gasoline (one percent) or diesel fuel (0.5 percent); and,

- Natural gas can be directly shipped via pipelines to the compressor station, rather than by on-road delivery trucks, and has less delivery accident risk than vehicle shipments.

- Based upon the preceding information, hazards associated with CNG are approximately equivalent or less compared to conventional fuels. Therefore, increased usage of CNG with a concurrent decline in usage of conventional fuels will not significantly alter existing hazards associated with mobile source fuels. Consequently, increased usage of CNG is not expected to generate significant adverse hazard impacts.

PROJECT-SPECIFIC MITIGATION – CNG: Less than significant impacts on hazards associated with the use of CNG as an alternative fuel are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS – CNG: The hazard impacts associated with using CNG as an alternative fuel are expected to be less than significant. Thus, no remaining hazard impacts associated with CNG use are expected.

4.4.4.2.4 Liquefied Natural Gas (LNG)

Natural gas can be liquefied by refrigerating it below -160 degrees Celsius or -260 degrees Fahrenheit at relatively low pressure (20 to 150 psig). Like CNG, there are NFPA standards (NFPA 59A – Standards for Production, Storage, and Handling of LNG and NFPA 57 – Standard for LNG Vehicular Fuel Systems) for the handling, storage, production, and use of LNG, especially in vehicles. However, unlike CNG, most LNG is not generated on-site. Instead, LNG is typically delivered via insulated double walled tanker trucks to distribution facilities. The double walled construction of the LNG tanker trucks are more robust than standard petroleum tanker trucks, therefore, the transport of LNG is safer from spills and tank ruptures during accidents than conventional fuel tanker trucks.

PROJECT-SPECIFIC IMPACTS – LNG HEALTH IMPACTS: The safety issues associated with LNG are similar to CNG, with the added hazards of handling a cryogenic liquid and the vaporization of the liquid. The cryogenic liquids have the potential to burn workers who come into contact with the liquid or uninsulated surfaces. This hazard can be mitigated by proper personal protective equipment and training. The vaporization of LNG in storage tanks can potentially cause a boiling liquid expanding vapor explosion (BLEVE). For a BLEVE to occur there would need to be a catastrophic failure of all safety measures, including safety relief valves and burst discs, built into the vessel the design code.

The main additional hazard associated with the use of LNG versus conventional fuels are personal injuries from contact with a cryogenic liquid and the potential for a large fire stemming from release in the case of an accident (e.g., a tanker truck accident or storage tank failure). Another potentially significant hazard is a release of natural gas during vehicle maintenance (DOT, 1995).

Hazards associated with LNG are that, under certain conditions, it may explode or catch on fire. LNG is not explosive or flammable in unconfined areas[4]. However, as it warms and expands to a gas it becomes flammable at a concentration between five and 15 percent.

LNG is comprised mostly of methane, but may contain ethane, propane and other heavier gaseous hydrocarbons. The main acute health effect associated with ammonia vapor is asphyxia. Asphyxia is the condition of severely depleting the oxygen supply to the body. Methane causes asphyxia by displacing oxygen in air. Asphyxiation can occur when oxygen concentrations drop below 18 percent. Oxygen is displaced to 18 percent at a concentration of 14 percent methane. Unconsciousness from central nervous system depression occurs at 30 percent methane[5]. The potential adverse health effects of oxygen deficiency are summarized in Table 4.4-4.

TABLE 4.4-4

Effects of Oxygen Deficiency

Amount of Oxygen Deficiency	Effects of Oxygen Deficiency
12-16 percent	Breathing and pulse rate are increased, with slight muscular incoordination
10-14 percent	Emotional upsets, abnormal fatigue from exertion, disturbed respiration
6-10 percent	Nausea and vomiting, inability to move freely, collapse, possible lack of consciousness
Below 6 percent	Convulsive movements, gasping, possible respiratory collapse and death

It is unlikely that off-site receptors would be exposed to LNG concentrations that would generate adverse health effects, because the lower explosive limit (LEL) for methane is five percent (50,000 ppm). The LEL is the concentration at which there is enough of the given gas to ignite or explode.

The methodology used for estimating the potential risk from a vapor explosion is that developed for off-site consequence analysis for the Risk Management Program (RMP) under 40 CFR 68 (EPA, 1999). For an RMP off-site consequence analysis, a gaseous release is assumed to produce a vapor explosion that results in a blast impact. For a vapor explosion, the significance level is a pressure wave (blast) of one pound per square inch (psi) and the metric examined is the modeled distance to the significant overpressure level.

4 Federal Energy Regulatory Commission, http://www.ferc.gov/o12faqpro/default.asp?Action=Q&ID=470

5 Canadian Centre for Occupational Health and Safety, http://www.ccohs.ca/oshanswers/chemicals/chem_profiles/methane/health_met.html

Other safety issues associated with LNG are similar to those discussed previously for CNG, with the added hazards associated with handling a cryogenic liquid. The hazards posed by the use of LNG versus gasoline and diesel fuel are:

- Diesel fuel and gasoline are toxic to the skin and lungs and LNG is not;
- Diesel fuel and gasoline vapors are heavier than air (for specific gravity of air = 1, gasoline is 3.4, diesel is greater than 4). LNG is lighter than air (specific gravity is 0.55) and disperses more readily in air;
- LNG has a higher auto ignition temperature (1,200 ^{o}F) than diesel (500 ^{o}F) or gasoline (500 ^{o}F). LNG is more difficult to ignite since it has a "lower flammability limit" that is higher (5.3 percent) than gasoline (one percent) or diesel fuel (0.5 percent);
- Cryogenic liquids such as LNG have the potential risk to workers of burns (frost-bite) that can be suffered if workers come in contact with the liquid or with surfaces that are not insulated. Proper safety equipment and training can minimize these hazards; and,
- Since LNG is a cryogenic liquid, in the event of a release from an aboveground storage tank or tanker truck, a fraction of the liquid immediately flashes off to gas while the remainder will pool and boil violently emitting dense vapor. The liquid transitions to dense vapor and the dense vapor transitions to gas as the liquid and vapor draw heat from the surroundings. If a source of ignition is present, the boiling liquid, vapor cloud and gas could explode and burn, threatening surrounding facilities and other storage vessels.

Based upon the preceding information, health hazards associated with LNG are approximately equivalent or less compared to conventional fuels. Therefore, increased usage of LNG with a concurrent decline in usage of conventional fuels will not significantly alter existing health hazards associated with mobile source fuels. Consequently, increased usage of LNG is not expected to generate significant adverse health hazard impacts.

PROJECT-SPECIFIC MITIGATION – LNG HEALTH IMPACTS: Less than significant impacts on health hazards associated with the use of LNG as an alternative fuel are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS – LNG HEALTH IMPACTS: The health hazard impacts associated with using LPG as an alternative fuel are expected to be less than significant. Thus, no remaining health hazard impacts associated with LPG use are expected.

PROJECT-SPECIFIC IMPACTS – LNG TRANSPORTATION RELEASE: LNG is non-toxic, disperses more readily in air than conventional fuels, and has more rigorous standards for transportation. It is expected that affected facilities will receive LNG from a local supplier located in the district. Deliveries of LNG would be made to the other affected facilities by tanker truck via public roads. The transport of LNG is regulated by the U.S. DOT. LNG trucks are double-walled aluminum and are designed to withstand accidents during the transport of LNG. LNG is loaded into delivery tanks at atmospheric pressure, which would be at its boiling point of -260ºF (-162ºC). The LNG is maintained at this temperature by evaporation of the boiling LNG and venting of the evaporated LNG. Because the vent is closed during shipment, the pressure in the tank builds and the temperature of the LNG increases. The FMCSA analyzed releases from delivery tanks with an average pressure of 30 psig, which would be -230ºF (-146ºC). At 30 psig, approximately 30 percent of the LNG will flash into vapor when released.

Transportation Release Scenarios: These LNG transport release scenarios were analyzed in the December 2007 Final EA for Proposed Amended Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Internal Combustion Engines (ICEs) (SCAQMD No. 280307JK). The following description of LNG transportation and consequences is taken from the Federal Motor Carrier Safety Administration (FMCSA)[6].

Four scenarios were identified as having major consequences:

1. Release of LNG into a pool that evaporates and disperses without ignition. Approximately 40 percent of the liquefied LNG immediately flashes into vapor. The temperature of the liquid pool would be -44 ºF (-42ºC) and would therefore damage exposed vegetation and people.

2. A flammable cloud is formed that contacts an ignition source. The flame front can flash back and set the liquid pool on fire. Quantities of LNG shipped by truck would not typically cause vapor cloud explosions.

3. A boiling liquid expanding vapor explosion (BLEVE) occurs. BLEVEs would occur when an LNG tank is exposed to fire and the increase in pressure within the tank exceeds the capacity of the relief valve.

4. The tank ruptures, rockets away and ignites.

RMPComp was used for the consequence analysis for these four scenarios. The adverse impacts from the four scenarios were determined to be:

1. The area of the pool was estimated by assuming a depth of one centimeter as described in Example 29 in the EPA's Risk Management Program Guidance for Offsite Consequence Analysis[7]. A 6,000 gallon LNG pool would be 24,448 square feet. This distance would be a "worst-case" since as the LNG pool expands from the tank it will warm and evaporate.

2. A pool fire of 6,000 gallons that is released in one minute would result in a heat radiation endpoint (five kilowatts/square meter) of 0.2 mile. If a vapor cloud fire occurs, the estimated distance to the lower flammability limit would be 0.3 mile.

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6 Federal Motor Carrier Safety Administration, Comparative Risks of Hazardous Materials and Non-Hazardous Materials Truck Shipment Accidents/Incidents, Final Report, March 2001, www.fmcsa.dot.gov/documents/hazmatriskfinalreport.pdf.

7 U.S. EPA, Risk Management Program Guidance for Offsite Consequence Analysis, EPA 550-B-99-009, April 1989.

3. Based on 10,000 gallons the BLEVE would result in a fireball that may cause second-degree burns out to 0.3 mile.

4. The "worst-case" release estimate for 10,000 gallons in RMP*Comp is 0.3 mile from the vapor cloud explosion. Since, it is unclear as to how far away the tank would travel, it was assumed that the adverse impact would be 0.3 mile from where the tank lands. Damage to property and persons may occur from physical impact from the rocketing tank.

During transportation of LNG, it was estimated that the adverse impacts from various releases would extend 0.3 mile. Because sensitive receptors may be within the endpoints above, the accidental release of LNG during transport could cause significant adverse hazards.

Based upon the preceding information, increased transport of LNG may substantially alter existing transportation hazards associated with mobile source fuels. Consequently, increased usage of LNG is expected to generate significant adverse hazard impacts during transport.

PROJECT-SPECIFIC MITIGATION – LNG TRANSPORTATION RELEASE: Potentially significant impacts on hazards impacts associated with the transportation of LNG as an alternative fuel are expected, so mitigation measures are necessary and required. Recommend mitigation would be to implement the following design measures that are typically required by local fire departments:

HZ-3: Install secondary containment (e.g., berms).

HZ-4: Install valves that fail shut.

HZ-5: Install emergency release values and barriers around LNG storage tanks to prevent the physical damage to storage tanks or limit the release of LNG from storage tanks.

HZ-6: Perform integrity testing of LNG storage tanks to assist in preventing failure from structural problems. Construct a containment system to be used for deliveries during off-loading operations.

REMAINING IMPACTS – LNG TRANSPORTATION RELEASE: No additional mitigation measures were identified that would reduce the hazard and hazardous material impacts from a transportation release of LNG to less than significant. Therefore, the remaining hazardous and hazardous material impacts from exposure to the one psi overpressure from the cataclysmic destruction of the LNG storage tank are considered to be significant.

4.4.4.2.5 Liquefied Petroleum Gas (LPG)

LPG, which is also known as propane, is a mixture of natural gases which are liquefied at ambient temperatures by compressing the gases to pressures above 120 psig. Propane is the major component of LPG, with the minor components being propylene, butane, and butene.

In the U.S., almost all of the propane supply comes from stripping wellhead natural gas or as a by-product of petroleum refining. LPG for vehicle use is at least 95 percent propane and no more than 2.5 percent butane and heavier hydrocarbons. LPG has been used in fleet vehicles since the 1940s, so there is a substantial base of experience with LPG as an automotive fuel.

For a variety of reasons, however, LPG is not considered the alternative fuel of the future. Its place has been taken by natural gas. Consequently, there has been little development in dedicated LPG engine technology. On the other hand, other technologies and their emissions improved tremendously over the last decade. As a result of that development, some of the previous emission reduction advantages of LPG fuel, especially the low CO emissions, are now less pronounced[8]. Consequently, it is not likely that LPG would be used to any great extent providing the fuel for near zero- or zero-emission technologies.

PROJECT-SPECIFIC IMPACTS - LPG: Since LPG is a compressed fuel, it shares many of the physical hazards (projectiles, freeze burns, BLEVE, etc.) of CNG and LNG and storage regulations. However, since LPG is under less pressure and is stored at ambient temperatures, the physical hazards are not as high for storage and transport compared to CNG or LNG. Furthermore, the flammability limit range for LPG is similar to gasoline, but the ignition temperature (920 degrees Fahrenheit) is lower than gasoline or diesel (500 degrees Fahrenheit). Therefore, the hazard from transport and storage of LPG should not be significantly different from the transport and storage of gasoline or diesel (DOT, 1995).

The main additional hazard associated with the use of LPG versus conventional fuels is the potential of a large fire stemming from a release in the case of an accident (e.g., a tanker truck accident). Another potentially significant hazard is a release of LPG during vehicle maintenance.

Compared with diesel fuel and gasoline the following can be stated about LPG:

- Diesel fuel and gasoline are toxic to the skin and lungs and LPG is not;
- Diesel fuel and gasoline vapors are heavier than air (for specific gravity of air =1, gasoline is 3.4, diesel fuel is 4.0). LPG is lighter than gasoline and diesel fuel but heavier than air (specific gravity is 1.52). It disperses more readily in air than gasoline or diesel fuel;
- LPG has a higher auto ignition temperature (920 ^{o}F) than diesel fuel (500 ^{o}F) or gasoline (500 ^{o}F);
- LPG is more difficult to ignite since it has a "lower flammability limit" that is higher (2.0 percent) than gasoline (one percent) or diesel fuel (0.5 percent).

Based upon the preceding information, hazards associated with LPG are approximately equivalent or less as compared to conventional fuels. Therefore, increased usage of LPG with a concurrent decline in usage of conventional fuels will not significantly alter existing

8 Net Technologies, Inc. How Clean Are LPG Engines. http://www.nett.ca/faq/lpg-3.html.

hazards associated with mobile source fuels. Consequently, increased usage of LPG is not expected to generate significant adverse hazard impacts.

PROJECT-SPECIFIC MITIGATION – LPG: Less than significant impacts on hazards associated with the use of LPG as an alternative fuel are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS – LPG: The hazard impacts associated with using LPG as an alternative fuel are expected to be less than significant. Thus, no remaining hazard impacts associated with LPG use are expected.

4.4.4.2.6 Biodiesel

Biodiesel is a fuel derived from biological sources such as vegetable oils or animal fats. The process for creating biodiesel involves mixing the oil with alcohol (e.g., methanol or ethanol) in the presence of a chemical such as sodium hydroxide. This process produces a methyl ester if methanol is used or an ethyl ester if ethanol is used. Methyl ester from soy beans is more economical to produce, and, therefore, is more common in the U.S. Biodiesel can be used pure (B100) or blended with conventional diesel. The most common blended biodiesel is B20, which is 20 percent biodiesel and 80 percent conventional diesel.

PROJECT-SPECIFIC IMPACTS – BIODIESEL: Biodiesel fuels are derived from vegetable oils and/or animal fats, the transport of which do not pose any significant hazards, as compared to conventional fuels which are derived from crude oil. Biodiesel and biodiesel blends have a higher flash point and lower vapor pressure than conventional diesel. This makes biodiesel safer to store and transport than conventional diesel. Furthermore, biodiesel is less toxic and more biodegradable than conventional diesel, so the environmental impacts from a spill would be less than for a spill of conventional diesel fuel. However, biodiesel has some compatibility issues with certain rubbers and plastics when compared to conventional diesel. Those leak hazards can be mitigated by using the proper material for seals, fittings, and hoses used for storage and transport. Therefore, the hazard from transport and storage of biodiesel and biodiesel blends should not be significantly different from the transport and storage of conventional diesel (DOT, 1995).

Biodiesels are considered safer than conventional diesels; therefore, increased usage of biodiesel with a concurrent decline in usage of conventional diesel will not significantly alter existing hazards associated with mobile source fuels. Consequently, increased usage of biodiesel is not expected to generate significant adverse hazard impacts.

PROJECT-SPECIFIC MITIGATION – BIODIESEL: Less than significant impacts on hazards associated with the use of biodiesel as an alternative fuel are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS – BIODIESEL: The hazard impacts associated with using biodiesel as an alternative fuel are expected to be less than significant. Thus, no remaining hazard impacts associated with biodiesel use are expected.

4.4.4.2.7 Hydrogen

Hydrogen is the simplest, lightest and most plentiful element in the universe. In its normal gaseous state, hydrogen is a colorless, odorless, tasteless, non-toxic and burns invisible. Most hydrogen is made from natural gas through a process known as steam reforming. Reforming separates hydrogen from hydrocarbons by adding heat. Hydrogen can also be produced from a variety of sources including water and biomass. Hydrogen can be used as a combustion fuel or in fuel cell vehicles to produce electricity to power electric motors. There is currently one commercially available fuel cell vehicle sold in the U.S., the Honda Clarity. Honda planned to have about 200 Clarities available for lease by 2010, but the actual number of Clarities on the road is estimated at 50 (AP, 2010). The majority of hydrogen powered vehicles on the road at this time are used for research and development or fleet use.

PROJECT-SPECIFIC IMPACTS - HYDROGEN: The generation and distribution of hydrogen as a consumer product is also still in developmental stages. Currently there are 23 hydrogen refueling stations, nine of which have public access (U.S. DOE, 2012). Most of the refueling stations depend on bulk liquid hydrogen delivery; however, a few hydrogen gas pipeline stations and on-site steam reformer stations exist. The physical hazards associated with bulk liquid transport and storage are similar to LNG, as they are both cryogenic liquids. The physical hazards associated with pipeline and steam reformer stations are similar to CNG, as they are both compressed gases. In general, the fire hazards associated with hydrogen spills or leaks is higher than conventional fuels. This is due to the wide flammability range and low ignition energy of hydrogen. However, hydrogen tanks are built to more rigorous standards than conventional fuel tanks, which reduces the likelihood of spills or leaks.

The main additional hazard associated with the use of hydrogen versus conventional fuels is the difficulty in seeing hydrogen fires and potentiality of a large fire stemming from a release in the case of an accident (e.g., a tanker truck accident). Another potentially significant hazard is a release of hydrogen in an enclosed space (e.g., garage or vehicle maintenance facility).

Compared with diesel fuel and gasoline, the following can be stated about hydrogen:

- Diesel fuel and gasoline are toxic to the skin and lungs and hydrogen is non-toxic and non-reactive, so if released, it does not present a health hazard to humans.
- Diesel fuel gasoline vapors are heavier than air (for specific gravity of air = 1, gasoline is 3.4, diesel fuel is 4.0) while hydrogen is 14 times lighter than air. If released, hydrogen will quickly dissipate into the atmosphere.
- Hydrogen has an extremely low ignition energy requirement; about 20 microjoules can ignite hydrogen/air, which is about 10 times less than what is required to ignite a gasoline/air mixture (LLNL, 2007).
- Hydrogen is clear, odorless, and tasteless. It burns with an extremely hot, but nonluminous flame which is difficult to see. The flame of burning hydrogen has few warning properties.

- Hydrogen has an unusually large flammability range and can form ignitable mixtures between four and 75 percent by volume in air. Given confinement and good mixing, hydrogen can be detonated over the range of 18 to 59 percent by volume in air.

Hydrogen is non-toxic and disperses more readily in air than gasoline or diesel. Based upon the preceding information, hazards associated with hydrogen are approximately equivalent or less when compared to conventional fuels. Furthermore, hydrogen is limited in its use as a transportation fuel. In 2007, there were 6,675,888 automobiles, commercial vehicles, and motorcycles registered in the County of Los Angeles alone (LADOT, 2009). The 2012 AQMP projects that the population of zero or near-zero vehicles will increase by about 37,000 vehicles, which means hydrogen is expected to make up a very small portion of transportation fuel (e.g., less than 0.1 percent). While hydrogen fuel cell technology is promising, its use in the future is dependent on many things (cost-effectiveness of the technology, availability of hydrogen, etc.), so that the extent to which it may be used in the future to replace petroleum fuels is currently unknown and, therefore, speculative. For these reasons, the use of hydrogen fuel is not expected to generate significant adverse hazard impacts.

PROJECT-SPECIFIC MITIGATION – HYDROGEN: Less than significant impacts on hazards associated with the use of hydrogen as an alternative fuel are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS – HYDROGEN: The hazard impacts associated with using hydrogen as an alternative fuel are expected to be less than significant. Thus, no remaining hazard impacts associated with hydrogen use are expected.

4.4.4.2.8 Electric/Hybrid

Electric (EVs) and hybrid vehicles (hybrids) both use electricity as part of their fuel system. EVs rely purely on electric power stored in batteries. Hybrids also use batteries as part of their fuel supply; however, hybrids supplement their electric demand by using gasoline engines to generate either mechanical or electric power on demand. Since gasoline is a conventional fuel, any difference in hazards associated with hybrid vehicles would be from the batteries. The most common battery technologies used in modern EVs and hybrids are nickel-metal hydride (NiMH) and lithium ion (Li-ion) (Hybrid, 2008).

PROJECT-SPECIFIC IMPACTS – ELECTRIC/HYBRID: NiMH batteries can generate hydrogen gas if overcharged, which can lead to explosions without proper venting. In 1996, the International Center for Technology Assessment (ICTA) conducted a comprehensive review of the safety concerns associated with the use of EVs. The ICTA found risk of hydrogen emissions during stressful conditions has been virtually eliminated by the use of seals and proper valve regulation. By following the National Electric Codes (NECs) and the Society of Automotive Engineers (SAE) recommended safety practices and guidelines for the operation and maintenance of EVs and hybrids, any hydrogen gas risk during battery recharging would be eliminated (ICTA, 1996).

Li-ion batteries can be fire hazards. There are a few reported cases of fires caused by Li-ion batteries in EVs. In response to these fires, the National Highway Traffic Safety Administration (NHTSA) performed an investigation on the fire hazards associated with Li-ion batteries in EVs. The NHTSA concluded that EVs do not pose a greater risk of fire than gasoline-powered vehicles. The NHTSA also developed an interim guidance, with the assistance of the NFPA, Department of Energy, and others, to increase and identify the appropriate safety measures for handling an EV or hybrid automobile accident (NHTSA, 2012).

Furthermore, all electrical propulsion vehicles must comply with Federal Motor Vehicle Safety Standard (FMVSS) 305. FMVSS 305 specifies performance requirements for limitation of electrolyte spillage, retention of propulsion batteries, and electrical isolation of the chassis from the high-voltage system during a crash event. FMVSS assures that accidents involving EVs and hybrids cause no more electrical hazard than a gasoline- or diesel-powered vehicle.

Electric propelled vehicles are considered less hazardous than conventional fuel vehicles. The 2012 AQMP expects to replace 37,000 conventional fuel vehicles with alternative-fueled vehicles by 2025, which would generally result in a reduction in hazards associated with conventional fueled vehicles.

PROJECT-SPECIFIC MITIGATION – ELECTRIC/HYBRID: Less than significant impacts on hazards associated with the use of batteries in electric/hybrid vehicles are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS – ELECTRIC/HYBRID: The hazard impacts associated with using batteries in electric/hybrid vehicles are expected to be less than significant. Thus, no remaining hazard impacts associated with using batteries for these types of vehicles are expected.

4.4.4.2.9 Summary of Hazards from Alternative Fuels

PROJECT-SPECIFIC IMPACTS – ALTERNATIVE FUELS SUMMARY: As shown in Table 4.4-5, the energy content of alternative fuels is lower than conventional fuels which means that more fuel is needed in an alternative fuel-powered vehicle to achieve the same range as a conventional fuel-powered vehicle. Thus, more tanker deliveries to supply refueling stations would be required to provide the same available energy as conventional fuels. Since the probability of accidents is related to the amount of miles traveled, proportionally more delivery accidents can be expected with alternative fuels than conventional fuels (assuming that they are delivered from similar source locations in similar sized tankers). However, the truck accident rate is small, on the order of one accident per five million miles traveled and the accident rate with chemical releases is even less. Furthermore, any increase in alternative fuels use would decrease the use of conventional fuels, so hazards associated with transportation and storage of all of the alternative fuels, except LNG would not be a significant risk factor. During transportation of LNG, it was estimated that the adverse impacts from various releases would extend 0.3 mile. Because sensitive receptors may be within the endpoints above, the accidental release of LNG during transport could cause significant adverse hazards.

TABLE 4.4-5

Equivalent Fleet Miles
Associated with Alternative Clean-Fuels

FUEL TYPE	BY MASS	BY VOLUME
Diesel	1.00	1.0
CNG/LNG	1.15	1.9
LPG	1.15	2.1
Ethanol	1.90	2.3
Methanol	2.50	2.7

Source: Clean Air Program: Summary of Assessment of the Safety, Health, Environmental and System Risks of Alternative Fuels. (DOT, 1995)

There are various existing regulations and recommended safety procedures that, when employed, will reduce any slightly higher hazards impacts associated with use of alternative clean fuels to the same or lower level as for conventional fuels. Table 4.4-6 summarizes some of the regulations and safety procedures associated with use of alternative fuels. When affected vehicle owners and maintenance personnel comply with existing regulations and recommended safety procedures, hazards impacts associated with the use of alternative fuels will be the same or less than those of conventional fuels. Accordingly, significant hazards impacts are not expected from the implementation of the 2012 AQMP control measures that encourage the use of alternative fuels.

TABLE 4.4-6

Summary of Hazards and Existing Safety Regulations/Procedures
Associated with Alternative Clean-Fuels

FUEL TYPE	HAZARD	REGULATION/PROCEDURE
Methanol	Methanol can ignite in enclosed spaces such as fuel tanks since its upper flammability limit is 15 percent and it is slightly heavier than air.	Modifications such as materials inside the fuel tank that can arrest and quench flame propagation and modifications to isolate the tank from sparks and ignition sources are required to avoid ignition in the fuel tanks.
Ethanol	Pure ethanol can ignite in enclosed spaces such as fuel tanks since its upper flammability limit is 19 percent and it is slightly heavier than air.	Modifications such as materials inside the fuel tank that can arrest and quench flame propagation and modifications to isolate the tank from sparks and ignition sources are required to avoid ignition in the fuel tanks.

TABLE 4.4-6 (Continued)

Summary of Hazards and Existing Safety Regulations/Procedures
Associated with Alternative Clean-Fuels

FUEL TYPE	HAZARD	REGULATION/PROCEDURE
CNG	CNG bottles are typically stored outside and are required to be above ground (NFPA 52) as opposed to below ground for gasoline or diesel tanks. There is a risk of vehicles colliding with the bottles causing a gas release.	Collisions can be mitigated by the installation of curbing and bollards to protect the tanks from vehicle operations (LAFC57.42.16).
	Releasing gas in a maintenance shop can potentially create explosive hazards.	Installation of methane detection systems in the shop can provide early detection of leaks and alert the maintenance personnel. (If integrated with vent systems, vents are not required to operate continuously - CFC 2903.2.5). Ignition sources can be reduced/eliminated by ensuring that all electrical systems in the shop are explosion proof (smoking and open flames are prohibited under CFC 2901.7). Providing adequate ventilation can prevent the occurrence of explosive conditions (required under CFC 2903.1). Procedures can be established to ensure that all vehicles requiring maintenance are defueled and depressurized before admission to the maintenance depot.
LNG	LNG is a cryogenic liquid and has the potential risk to workers of burns (frostbite) that can be suffered if workers come in contact with the liquid or with surfaces that are not insulated.	Proper safety equipment and training can mitigate these hazards.
	Releasing LNG in an enclosed area where there are potential ignition sources such as a maintenance shop may pose an explosive hazard. (A flammable concentration within an enclosed space in the presence of an ignition source can explode).	Installation of flammable gas detection systems in a maintenance shop can provide early detection of leaks and alert the maintenance personnel (which is required for LNG under CFC2903.3). Ignition sources can be reduced/eliminated by ensuring that all electrical systems in the shop are explosion proof (smoking and open flames are prohibited under CFC 2901.7). Providing adequate ventilation can prevent the occurrence of explosive conditions (required under CFC2903.1). Vehicle fuel shut-off valves shall be closed prior to repairing any portion of the vehicle fuel system (CFC2903.4.1). Vehicles fueled by LNG, which may have sustained damage to the fuel system, shall be inspected for integrity with a gas detector before being brought into the garage (CFC2903.4.2). Procedures can be established to ensure that all vehicles are defueled prior to maintenance.

TABLE 4.4-6 (Concluded)
Summary of Hazards and Existing Safety Regulations/Procedures
Associated with Alternative Clean-Fuels

FUEL TYPE	HAZARD	REGULATION/PROCEDURE
LNG	LNG is generally stored above ground. Since it is a cryogenic liquid, in the event of a release, a fraction of the liquid immediately flashes off to gas while the majority of the remainder will pool and boil violently emitting dense vapor. If a source of ignition is present, the boiling liquid, dense vapor and gas could explode and burn threatening surrounding facilities and other storage vessels.	Tanks can be protected by containment dikes (required if neighboring tanks can be affected LAFC57.42.11) and physically separated LAFC57.42.10) so that they do not interact in case of a fire or explosion. Deluge systems can be installed to cool neighboring tanks in case of a fire.
Biodiesel	Certain materials used in conventional petroleum storage are not compatible with pure biodiesel.	Use biodiesel compatible plastic and rubber for fittings.
Hydrogen	Releasing gas in enclosed spaces with its related explosive hazards may pose an explosive hazard. (A flammable concentration within an enclosed space in the presence of an ignition source can explode).	Installation of combustible gas detection systems can provide early detection of leaks. Ignition sources can be reduced/eliminated by ensuring that all electrical systems in the shop are explosion proof. Providing adequate ventilation can prevent the occurrence of explosive conditions. Procedures can be established to ensure that all vehicles are defueled prior to maintenance.
EV and Hybrid Vehicles	Certain types of batteries that are used in commercially available electric vehicles emit hydrogen during the charging process. Emission of hydrogen gas in an enclosed setting such as a garage presents the potential for the accumulation of flammable concentrations.	Forced ventilation can prevent build-up but if ventilation fails, a hazardous condition can occur. NEC and SAE recommended practices provide strict guidance for eliminating hydrogen gas risk.
	Li-ion batteries that are used in some commercially available electric vehicles can combust spontaneously.	Reinforced casing and battery cooling systems can prevent the combustion of Li-ion batteries. FMVSS 305 and SAE recommendations provide guidance for eliminating combustion risk.

CWC = California Fire Code
FMVSS = Federal Motor Vehicle Safety Standard
NEC = National Electric Code
CWC = California Fire Code
NFPA = National Fire Protection Association
SAE = Society of Automotive Engineers
LAFC = City of Los Angeles Fire Code. It is expected that cities in Orange, Riverside, and San Bernardino Counties have in place similar regulations.

Use of alternative fuels will require additional knowledge and training of owners/operators of fueling stations regarding maintaining and operating alternative fuel refueling stations and emergency responders. Further, as use of alternative fuels increases in the district, use of conventional fuels such as gasoline and diesel will decline. As a result, explosion and flammability hazards associated with conventional fuels will also decline. In addition, hazards and hazardous clean-up associated with accidental releases of conventional fuels, especially diesel, are reduced with increasing use of alternative fuels.

PROJECT-SPECIFIC MITIGATION - ALTERNATIVE FUELS SUMMARY: When users of alternative fuels comply with existing regulations and recommended safety procedures, hazards impacts associated with the use of alternative clean-fuels are expected to be the same or less than those of conventional fuels. Accordingly, hazards impacts from the increased use of alternative fuels are expected to be similar to or less than hazards associated with conventional fuels. Therefore, significant hazard impacts are not expected from the increased use of alternative fuels and no mitigation measures are required.

The transportation analysis demonstrated that, of all the alternative fuels analyzed, only LNG was estimated to have significant adverse hazards impacts during various transportation release scenarios. Because significant hazard impacts during transportation of LNG are expected, mitigation measures are required to be identified.

Lastly, the hazard impacts associated with using batteries in electric/hybrid vehicles were concluded to be less than significant. Because no significant hazard impacts were identified that pertain to using batteries in electric/hybrid vehicles, no mitigation measures are required.

REMAINING IMPACTS – ALTERNATIVE FUELS SUMMARY: The hazard impacts associated with alternative fuels and using batteries in electric/hybrid vehicles are expected to be less than significant, except for LNG transportation which was shown to have significant hazards impacts requiring mitigation. However, no additional mitigation measures were identified that would reduce the hazard and hazardous material impacts from a transportation release of LNG to less than significant. Therefore, the remaining hazardous and hazardous material impacts from exposure to the one psi overpressure from the cataclysmic destruction of the LNG storage tank are considered to be significant.

For all other alternative fuels (e.g., other than LNG) and batteries for electric/hybrid vehicles, no remaining hazard impacts are expected.

4.4.4.3 Ammonia Use in SCRs and SNCRs

Implementation of some control measures proposed in the 2012 AQMP could result in the use of SCR or SNCR technology to reduce NOx emissions including CMB-01, IND-01, MSC-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-04, and ADV-05. Greater use of SCRs and SNCRs may occur on industrial combustion sources such as boilers and heaters, as well as large diesel engines on mobile sources to reduce NOx, including off-road diesel engines (e.g., locomotive engines and marine vessel engines).

SCR is post-combustion control equipment for NOx control of existing combustion sources like boilers, steam generators and process heaters that is capable of reducing NOx emissions by as much as 90 percent or higher. A typical SCR system design can consist of an ammonia storage tank, ammonia vaporization and injection equipment, an SCR reactor with catalyst, ancillary electronic instrumentation and operations control equipment. In some situations, an SCR system may also utilize a booster fan for the flue gas exhaust and an exhaust stack. The way an SCR system reduces NOx is through a matrix of nozzles injecting a mixture of ammonia and air directly into the flue gas exhaust stream from the combustion equipment. As this mixture flows into the SCR reactor that is replete with catalyst, ammonia and oxygen (from the air), the flue gas exhaust reacts primarily (i.e., selectively) with NO and NO2 to form nitrogen and water in the presence of a catalyst. The amount of ammonia introduced into the SCR system is approximately a 1.0-to-1.05 molar ratio of ammonia to NOx for optimum control efficiency, though the ratio may vary based on equipment-specific NOx reduction requirements. The ammonia injection rate is also regulated by the fuel flow rate to the unit.

SNCR is another post-combustion control technique typically used to reduce the quantity of NOx produced in the hot flue gas, by injecting ammonia. The main differences between SNCR and SCR is that the SNCR reaction between ammonia and NOx in the hot flue gas occurs without the need for a catalyst, but at much higher temperatures (i.e., between 1200 ^{o}F to 2000 ^{o}F). With a control efficiency ranging between 80 and 85 percent, SNCR does not achieve as great of NOx emission reductions as SCR. The need for the exhaust temperature to be high also limits the applicability of SNCR. SNCR would not be considered equivalent to BARCT alone, but it could be used if combined with other technologies.

In SCR and SNCR technology, ammonia or urea is used to react with the NOx, either in the presence of a catalyst or without a catalyst, respectively, to form nitrogen gas and water. Ammonia is the primary hazardous chemical identified with the use of air pollution control equipment (e.g., SCR and SNCR systems). Ammonia, though not a carcinogen, can have chronic and acute health impacts. Therefore, a potential increase in the use of ammonia may increase the current existing risk setting associated with deliveries (i.e., truck and road accidents) and onsite or offsite spills for each facility that currently uses or will begin to use ammonia. Exposure to a toxic gas cloud is the potential hazard associated with this type of control equipment. A toxic gas cloud is the release of a volatile chemical such as anhydrous ammonia that could form a cloud that migrates off-site, thus exposing individuals. Anhydrous ammonia is heavier than air such that when released into the atmosphere, would form a cloud at ground level rather than be dispersed "Worst-case" conditions tend to arise when very low wind speeds coincide with the accidental release, which can allow the chemicals to accumulate rather than disperse. Though there are facilities that may be affected by the proposed 2012 AQMP control measures that are currently permitted to use anhydrous ammonia, for new construction, however, current SCAQMD policy no longer allows the use of anhydrous ammonia. Instead, to minimize the hazards associated with ammonia used in the SCR or SNCR process, aqueous ammonia (100 percent anhydrous ammonia diluted with water to 19 percent by volume), is typically required as a permit condition associated with the installation of SCR or SNCR equipment for the following reasons: 1) 19 percent aqueous ammonia does not travel as a dense gas like anhydrous ammonia; and, 2) 19 percent aqueous ammonia is not on any acutely hazardous material lists unlike anhydrous ammonia or aqueous ammonia at higher percentages. For these safety reasons, aqueous ammonia is recommended for use in these technologies.

In addition, safety hazards related to the transport, storage and handling of ammonia exist. Ammonia has acute and chronic non-cancer health effects and also contributes to the formation of ambient PM10 and PM2.5 emissions under some circumstances. Since ammonia is not typically considered to be a flammable compound, other types of hazard impacts such as fires and explosions are not expected to occur and, therefore, will not be evaluated as part of this hazards analysis. To further evaluate the potential for significant adverse environmental impacts due to an accidental release of ammonia, various scenarios were evaluated that could occur during the onsite storage, transportation, and transfer of ammonia. These scenarios and their consequences are discussed in detail below.

PROJECT-SPECIFIC IMPACTS – WATER QUALITY: A spill of any of the hazardous materials (including ammonia) used and stored at any of the affected facilities could occur under upset conditions such as an earthquake, tank rupture, or tank overflow. Spills could also occur from corrosion of containers, piping and process equipment; and leaks from seals or gaskets at pumps and flanges. A major earthquake would be a potential cause of a large spill. Other causes could include human or mechanical error. Construction of the vessels, and foundations in accordance with the California Building Code requirements helps structures to resist major earthquakes without collapse, but may result in some structural and non-structural damage following a major earthquake. As required by U.S. EPA's spill prevention control and countermeasure regulations, all of the affected facilities are currently required to have emergency spill containment equipment and would implement spill control measures in the event of an earthquake. Storage tanks typically have secondary containment such as a berm, which would be capable of containing 110 percent of the contents of the storage tanks. Therefore, should a rupture occur, the contents of the tank would be collected within the containment system and pumped to an appropriate storage tank.

Spills at affected industrial or commercial facilities would be collected within containment structures. Large spills outside of containment areas at affected facilities that could occur when transferring the material from a transport truck to a storage tank are expected to be captured by the process water system where they could be collected and controlled. Spilled material would be collected and pumped to an appropriate tank or sent off-site if the materials cannot be used on-site.

PROJECT-SPECIFIC MITIGATION – WATER QUALITY: Because of the containment system design, spills are not expected to migrate from the facility and as such, potential adverse water quality hazard impacts are considered to be less than significant. Since hazard impacts that would affect water quality are expected to be less than significant, no mitigation measures are necessary or required.

REMAINING IMPACTS – WATER QUALITY: The hazard impacts associated with ammonia use potentially impacting water are expected to be less than significant. Thus, no remaining hazard impacts are expected.

PROJECT-SPECIFIC IMPACTS – TRANSPORTATION RELEASE: It is expected that affected facilities will receive ammonia from a local ammonia supplier located in the greater Los Angeles area. Deliveries of aqueous ammonia would be made to the other affected facilities by tanker truck via public roads. The maximum capacity of an ammonia tanker truck is approximately 7,000 gallons.

Transportation Release Scenario 1: This aqueous ammonia truck transport release scenario is taken from the Final Environmental Impact Report for Los Angeles Department Of Water And Power's (LADWP) Installation Of Five Combustion Turbines At The Harbor Generating Station (HGS), Installation Of Three Selective Catalytic Reduction Systems At

The modeling[9] was based on U.S. EPA's RMP Guidance for toxic releases and explosions. The RMP*Comp model was used to calculate size of the impact zones for explosions and toxic releases. Note that the concentration of aqueous ammonia used at the project sites was expected to be 29.5 percent. To calculate ammonia emissions for modeling purposes, U.S. EPA's data for aqueous ammonia with a 30 percent concentration was used since 29.5 percent concentration data were not available. Appendix D of the Final EIR for the LADWP project provides a more detailed discussion of the modeling approach and shows the results of the RMP*Comp model and the Screen3 model. For all toxic releases, the surrounding terrain was assumed to be "rural," consistent with SCAQMD guidance. This reduced the dispersion of the modeled compound with distance and is a more conservative assumption than assuming "urban" dispersion.

The hazard analysis for the HGS also evaluated the probability or frequency of an accidental release. The expected accident frequency of an accidental ammonia release was expected to increase because there would be one extra ammonia truck delivery per week. However, the truck accident rate is approximately one per 8.7 million miles traveled and a major release in an accident is about one in forty. One additional delivery per week of about 21 miles estimated distance would not introduce a significant incremental risk over the current situation. The frequency would change from about one per 300,000 years for a major 5,000-gallon release to one per 150,000 years. Because the HGS was already receiving 39.5 percent aqueous ammonia by truck, this result did not exceed the existing risks from an accidental release of ammonia and for this project, was concluded to be less than significant. Had this risk scenario represented a new hazard risk, the conclusion would most likely have been that hazard risks from the accidental release would have been considered significant.

The hazard analysis included an estimate for the HGS site of the impact of the unconfined release of 5,000 gallons of aqueous ammonia in a tanker truck accident in an open area (minimum dispersion with distance). The 5,000 gallons spreads in all directions in an unconfined manner to a depth of one centimeter on an impervious surface (U.S. EPA "worst-case" assumptions). Based on these extremely conservative assumptions, the toxic impact distance from the spill was estimated to be 2,300 meters.

The analysis of hazard impacts for the LADWP project also included an estimate for the accidental release of ammonia transported to the Valley Generating Station (VGS) site. The results were based on the impact of an unconfined release of 5,000 gallons of aqueous ammonia in a tanker truck accident in an open area (minimum dispersion with distance). The 5,000 gallons spread in all directions in an unconfined manner to a depth of one centimeter on an impervious surface (U.S. EPA "worst-case" assumptions). Based on these

9 This analysis uses the *Final Environmental Impact Report for the Scattergood Generating Station, And The Installation Of One Combustion Turbine At The Valley Generating Station* (SCH. No. 2000101008; SCAQMD, 2001), as a surrogate for transport release scenario 1.

extremely conservative assumptions and using the endpoint of an ammonia concentration of 200 ppm, the toxic impact distance from the spill was estimated to be 2,300 meters. Similar to the result for the HGS, this result represents an existing accidental release of ammonia consequence and, therefore, was concluded to be less than significant. Had this been the result for a new project the conclusion would likely have been significant. The expected accident frequency will be based on one delivery per month. The truck accident rate is approximately one per 8.7 million miles traveled and a major release in an accident is about one in 40. One delivery per month of about 36 miles distance would not introduce a significant risk. The expected frequency of a release is about one per 800,000 years.

Transportation Release Scenario 2: To evaluate the hazard impacts from an accidental release of ammonia during ammonia transport, this analysis uses as a surrogate the project at the ConocoPhillips Carson Refinery in which a SCR was installed on boiler #10 and an associated 10,000 gallon aqueous ammonia storage tank (19 percent ammonia) was constructed. This scenario[10] is used as an example of the type of project that could occur in the future as a result of complying with 2007 AQMP measures. This project required approximately six additional aqueous ammonia truck transport trips per month. Although truck transport of aqueous ammonia and other hazardous materials is regulated for safety by the U.S. Department of Transportation, there is a possibility that a tanker truck could be involved in an accident that would cause its contents to spill. The factors that enter into accident statistics include distance traveled and type of vehicle or transportation system. Factors affecting automobiles and truck transportation accidents include the type of roadway, presence of road hazards, vehicle type, maintenance and physical condition, driver training, and weather. A common reference frequently used in measuring risk of an accident is the number of accidents per million miles traveled. Complicating the assessment of risk is the fact that some accidents can cause significant damage without injury or fatality and as a result are not always reported.

Every time hazardous materials are moved from the site of generation, opportunities are provided for an accidental (unintentional) release. A study conducted by the U.S. EPA indicates that the expected number of hazardous materials spills per mile shipped ranges from one in 100 million to one in one million, depending on the type of road and transport vehicle used. The U.S. EPA analyzed accident and traffic volume data from New Jersey, California, and Texas, using the Resource Conservation and Recovery Act Risk/Cost Analysis Model and calculated the accident involvement rates presented in Table 4.4-7. This information was summarized from the Los Angeles County Hazardous Waste Management Plan (Los Angeles County, 1988).

[10] This scenario uses the *Final Negative Declaration for: ConocoPhillips Los Angeles Refinery Carson Plant SCR Unit Project*, SCH. No. 2004011066, SCAQMD 2004, as a surrogate for transport release scenario 2.

TABLE 4.4-7

Truck Accident Rates for Cargo On Highways

HIGHWAY TYPE	ACCIDENTS PER 1,000,000 MILES
Interstate	0.13
U.S. and State Highways	0.45
Urban Roadways	0.73
Composite [a]	0.28

Source: Environmental Protection Agency, 1984.
[a] Average number for transport on interstates, highways, and urban roadways.

In the study completed by U.S. EPA, cylinders, cans, glass, plastic, fiber boxes, tanks, metal drum/parts, and open metal containers were identified as usual container types. For each container type, the expected fractional release en route was calculated. The study concluded that the release rate for tank trucks is much lower than for any other container type (Los Angeles County, 1988).

The accident rates developed based on transportation in California were used to predict the accident rate associated with trucks transporting aqueous ammonia to the facility. Assuming an average truck accident rate of 0.28 accident per million miles traveled (Los Angeles County, 1988), the estimated accident rate associated with transporting aqueous ammonia for the ConocoPhillips project is 0.00101, or about one accident every 992 years.

The actual occurrence of an accidental release of a hazardous material cannot be predicted. The location of an accident or whether sensitive populations would be present in the immediate vicinity also cannot be identified. In general, the shortest and most direct route that takes the least amount of time would have the least risk of an accident. Hazardous material transporters do not routinely avoid populated areas along their routes, although they generally use approved truck routes that take population densities and sensitive populations into account.

The hazards associated with the transport of regulated (CCR Title 19, Division 2, Chapter 4.5 or the California Accidental Release Prevention Program requirements) hazardous materials, including aqueous ammonia, would include the potential exposure of numerous individuals in the event of an accident that would lead to a spill. Factors such as amount transported, wind speed, ambient temperatures, route traveled, distance to sensitive receptors are considered when determining the consequence of a hazardous material spill.

In the unlikely event that the tanker truck would rupture and release the entire 7,000 gallons of aqueous ammonia, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. For a road accident, the roads are usually graded and channeled to prevent water accumulation and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent evaporative emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. In a typical release scenario, because of the characteristics of most roadways, the pooling effect on an impervious surface would not typically occur. As a result, the spilled ammonia would not be expected to form pools that could evaporate into a toxic cloud at concentrations that could significantly adversely affect residences or other sensitive receptors in the area of the spill.

Based on the low probability of an ammonia tanker truck accident with a major release and the potential for exposure to low concentrations, if any, the conclusion of this analysis was that potential impacts due to accidental release of ammonia during transportation are less than significant.

Transportation Release Scenario 3: This transportation release scenario uses as a surrogate analysis a project at the BP Carson refinery in which SCR was retrofitted onto an existing FCCU and an associated 12,660 gallon aqueous ammonia storage tank (19 percent NH_3) was constructed. The following summarizes the ammonia transport analysis for the BP FCCU project.

This scenario[11] consists of an SCR retrofitted onto an existing FCCU and construction of an associated 12,660 gallon aqueous ammonia storage tank (19 percent NH_3). It was estimated to require approximately 35 tanker truck deliveries of aqueous ammonia during the first year of operation (two deliveries after construction to fill the tank plus one delivery every 11 days to replenish the tank during operations). Truck accident rates are approximately one in 8.7-million miles (SCAQMD, 2002). Based upon the projected 35 ammonia deliveries the first year, and a distance of 30 miles from the supplier to the facility, the number of truck-miles associated with the transport of aqueous ammonia is 1,050 truck-miles per year. The expected number of truck accidents associated with the proposed BP Carson project is therefore approximately once every 8,300 years. The likelihood of any release in a transportation accident is one in 10, and that of a large release in a transportation accident is one in 40 (SCAQMD, 2002). The likelihood of a major transportation release after the project is constructed is therefore approximately once per 330,000 years (8,300 times 40). The probability of a transportation accident that would pose a significant risk to the public is therefore insignificant.

In the unlikely event that a major release occurred during a tanker truck accident, the ammonia solution would have to pool and spread out over a flat surface in order to create sufficient evaporation to produce a significant vapor cloud. Roads are usually graded and channeled to prevent water accumulation, and a spill would be channeled to a low spot or drainage system, which would limit the surface area of the spill and the subsequent toxic emissions. Additionally, the roadside surfaces may not be paved and may absorb some of the spill. Without this pooling effect on an impervious surface, the spilled ammonia would not evaporate into a toxic cloud and impact residences or other sensitive receptors in the area of the spill. Therefore, potential impacts due to accidental release of ammonia during transportation are less than significant.

PROJECT-SPECIFIC MITIGATION – TRANSPORTATION RELEASE: The transportation release scenarios in this subsection do not include transport of anhydrous ammonia because SCAQMD has historically found the CEQA analysis of permit

[11] This scenario uses the *Final Negative Declaration for: BP Carson Refinery Fluid Catalytic Cracking Unit NOx Reduction Project*: SCH. No. 2002021068; SCAQMD, 2002, as a surrogate for transport release scenario 2.

applications for new projects requiring SCR equipment using anhydrous ammonia to have significant adverse hazards impacts. Anhydrous ammonia impacts can be substantially mitigated through use of aqueous ammonia, which is considered to be feasible mitigation. Similarly, accidental releases of ammonia during transport that may occur in connection with the proposed control measures impacts are considered to be less than significant because the concentration of ammonia transported will be less, at 19 percent by volume as compared to 29.5 percent by volume; consequences of an accidental release during transport would be less than for the LADWP project; although probability would increase, the probability of an accidental release remains relatively remote. SCAQMD Staff recommends that permit applicants use aqueous ammonia at 19 percent or less by volume for any new SCR systems.

REMAINING IMPACTS – TRANSPORTATION RELEASE: The hazard impacts associated with a transportation release are expected to be significant prior to mitigation. Requiring the use of aqueous ammonia, in lieu of anhydrous ammonia, is considered to be feasible mitigation. Thus, after mitigation, no remaining significant impacts on transportation release hazards are expected.

PROJECT-SPECIFIC IMPACTS – AMMONIA TANK RUPTURE ON-SITE:

Storage Tank Rupture Scenario 1: For this project[12], a 10,000 gallon storage tank constructed for an ammonia storage tank release scenario, impacts were calculated for an accidental release of 19 percent aqueous ammonia into a containment dike (see Appendix B of the Final Negative Declaration for the detailed hazards analysis). A series of release and dispersion calculations were completed to quantify the dispersion of ammonia gas evaporating from a pool of aqueous ammonia following a release from a storage tank on the premises of the ConocoPhillips Carson Plant. The dispersion calculations were performed until specific ammonia concentrations were reached in the downwind direction. Two ammonia concentrations were chosen for evaluation:

- **Emergency Response Planning Guide Level 2 (ERPG-2) (200 ppm):** The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their ability to take protective action.
- **Emergency Response Planning Guide Level 3 (ERPG-3) (1,000 ppm):** The maximum airborne concentration below which it is believed nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects.

The hazard zones resulting from liquid releases into the storage containment areas were identified and evaluated to determine the extent and location of the gas cloud containing ammonia. . Details on the accidental release modeling assumptions are included in Appendix B of the Final Negative Declaration. The dispersion analysis was completed for a

12 This scenario uses the *Final Negative Declaration for: ConocoPhillips Los Angeles Refinery Carson Plant SCR Unit Project*, SCAQMD 2004, as a surrogate for a tank rupture scenario.

range of impoundment sizes ranging from 100 to 1,000 feet. The following conclusions were drawn from this analysis:

1. Under "worst-case" atmospheric conditions (e.g., low winds and stable air), the lowest ammonia concentration of interest (ERPG-2 level of 200 ppm), does not reach the closest property line. The liquid impounding area would have to be much larger than 1,000 square feet (ft^2) to exceed the ERPG-2 level.
2. Under all other atmospheric conditions (e.g., high winds, less stable atmospheres), the distances to the 200 ppm ammonia concentration level would be shorter.
3. Under no condition does the 1,000 ppm ammonia concentration level extend further than 45 feet from the tank. This distance is always well within the Carson Plant property boundaries.

Based on the above, as long as the containment area is no larger than 1,000 square feet, a release of ammonia from the tank would remain within about 45 feet from the tank, which is well within the boundaries of the Carson Plant. ConocoPhillips proposed a concrete spill containment of 18 feet by 18 feet, for a total of 324 square feet. Therefore, the containment area is less than 1,000 square feet and a release from the ammonia tank is not expected to result in a significant adverse hazard impact.

The modeling analysis completed above for the ammonia tank release would also apply to a release of ammonia when the tank truck is unloaded and transferred to the storage tank. Containment facilities are provided at the truck loading rack to contain ammonia in the event of a spill during transfer activities. The ammonia concentration will be less than the ERPG 2 level of 200 ppm at the facility boundaries, as long as the containment area is limited to 1,000 ft^2.

Storage Tank Rupture Scenario 2: This tank rupture scenario[13] is based on retrofitting an existing FCCU with SCR and constructing an associated 12,660 gallon aqueous ammonia storage tank. The following two off-site consequences analyses (OCA) were performed:

1. Complete release of the aqueous ammonia storage tank (10,413-gallon working volume) into a 1,000-square foot diked containment area (25 feet x 40 feet). The bermed area was assumed to empty quickly into a catch basin with sufficient capacity to contain the entire contents of the ammonia tank with freeboard for precipitation and 12,000 gallons of firewater.

2. Complete release of an aqueous ammonia tanker truck (7,000 gallons) into the bermed unloading area. The ammonia then immediately drains into the tank pad containment structure.

RMP guidelines require assessment of the catastrophic failure of the largest storage vessel in a process as part of a RMP analysis. An OCA was therefore performed for a catastrophic rupture of the ammonia tank as a "worst-case" release scenario. The "worst-case"

[13] This scenario uses the *Final Negative Declaration for: BP Carson Refinery Fluid Catalytic Cracking Unit NOx Reduction Project*: SCH. No. 2002021068; SCAQMD, 2002, as a surrogate for a tank rupture scenario.

meteorological conditions of "F" stability (very stable dispersion conditions) and a wind speed of 1.5 meters per second (m/s) are defined by U.S. EPA to exist during a "worst-case" release (SCAQMD, 2002).

An unloading spill was evaluated as an alternative release scenario. The maximum potential surface area during an unloading spill is identical with that for the tank rupture scenario (1,000 square feet) since the unloading area drains to the storage tank containment structure. The meteorological conditions for an alternative release scenario are less restrictive than the "worst-case" conditions and are defined by U.S. EPA as "D" stability (neutral dispersion conditions) and a wind speed of 3.0 m/s (SCAQMD, 2002). The emission rate during the alternative release scenario is larger than during the "worst-case" release scenario because the wind speed is higher (3.0 m/s versus 1.5 m/s).

The U.S. EPA RMP*Comp (Version 1.06) program was used to perform the OCA hazard assessment for the BP FCCU project. The RMP*Comp model estimates the distance at which the downwind concentration of the spilled material falls below the Emergency Response Planning Guideline Level 2 (ERPG-2) concentration level of 0.14 mg/l (200 ppm). The minimum distance to the toxic threshold concentration allowed by RMP*Comp is 0.1 mile (approximately 200 m).

For the "worst-case" release scenario involving the rupture of the entire storage vessel, the estimated distance to the 200 ppm significance threshold concentration was 0.1 mile. As the tank is located approximately 685 feet (0.13 mile) from the nearest property boundary, the "worst-case" release scenario is not projected to have an off-site impact. Therefore, because the toxic threshold concentration does not extend off-site, the "worst-case" impact is not significant.

The Negative Declaration for the BP FCCU project noted further that the American Institute of Chemical Engineers (AIChE) Center for Chemical Process Safety (AIChE, 1989) has determined that the mean time to catastrophic failure for a metallic storage vessel at atmospheric pressure is 0.985 per million hours (approximately once per 112 years). For aqueous ammonia tanks used at power plants, the California Energy Commission concluded that the catastrophic failure of an aqueous ammonia storage tank is an extremely unlikely event because the probability of a complete tank failure is insignificant, and the risk of failure due to other causes such as external events and human error also is insignificant. In addition, there is no record of any aqueous ammonia storage tank having had a catastrophic failure in recent history. Therefore, the likelihood of a rupture of the aqueous ammonia storage tank occurring is extremely low (SCAQMD, 2002).

For the alternative release scenario involving a tanker-truck unloading accident, the surface area of the release is identical with that for the "worst-case" scenario, but the release rate is greater because of the higher wind speed assumed. However, because the meteorological conditions for an alternative release scenario are less restrictive than that for the "worst-case" scenario, the estimated distance to the toxic threshold concentration (less than 0.1 mile) is less than that for the "worst-case" scenario. This impact was not considered significant because there were no offsite exposure concentrations that exceeded the ERPG-2 level of 200 ppm.

The release of the entire truckload of 7,000 gallons of ammonia in an unloading accident is also a highly unlikely scenario. Leaks of ammonia from a bad connection or damaged hose would be very noticeable and quickly corrected. Should the connection suddenly break, the operator would be able to hit the emergency shut-off valve, hence substantially limiting the amount of spillage. Therefore, should an accident occur, it is likely that less than the entire load would be spilled before the release is controlled. The analysis concluded that both off-site release scenarios would be less than significant. It is expected that these results would be similar for any future SCR (or SNCR) projects at large industrial or commercial facilities.

Storage Tank Rupture Scenario 3: This scenario[14] describes hazard impacts from an accidental release of ammonia from a 5,000 gallon storage tank constructed for an SCR project for a biogas facility. The retrofit of existing ICEs with SCR or NOxTech systems were determined to likely need to install ammonia storage tanks. Based on considerations like available area, amount of ammonia needed per year, etc., SCAQMD staff assumed that the largest ammonia tank installed would be 5,000 gallons. Due to local fire department safety regulations, storage tanks constructed at affected facilities would be surrounded by secondary containment designs (e.g., dykes, berms, etc.). These same containment facilities would be provided at truck loading racks to contain ammonia in the event of a spill during transfer of ammonia from the truck to the storage tank.

The worst-case release scenario would be a catastrophic storage tank failure. The rupture of an ammonia storage tank would release the ammonia into the secondary containment area. Ammonia would then form a liquid pool in the secondary containment area and evaporate. A modeling analysis was performed based on EPA's RMP Guidance for worst-case estimates for toxic releases and explosions. The RMPComp model was used to calculate the size of the impact zones. The EPA endpoint for ammonia exposure is the distance from the spill that is required to reduce the concentration to 0.14 micrograms per liter, the ERPG 2 endpoint for ammonia. The RMPComp program estimates were based on 20 percent aqueous ammonia, which is slightly higher concentration than the 19 percent ammonia proposed for this project. The 20 percent concentration is built into RMPComp and was the closest concentration available for use by the model.

To provide a “worst-case” case analysis for all ammonia tank release scenarios, the following assumptions were made:

- Ammonia tank dimensions were assumed to be twice as wide as they were high;
- The ammonia tank volume was assumed to be 10 percent larger than the nominal containment volume. (For a tank with 5,000-gallon contents, the tank volume was assumed to be 5,500 gallons);
- All dike areas were assumed to have excess capacity of 20 percent more than the tank contents. (The dike capacity for 5,000-gallon contents was assumed to be 6,000 gallons);

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14 This scenario uses the December 2007 Final EA for Proposed Amended Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Internal Combustion Engines (ICEs) (SCAQMD No. 280307JK, as a surrogate for a tank rupture scenario.

- All dike walls were assumed to be three feet high;
- For unconfined ammonia spills, the liquid was assumed to spread to a thickness of one centimeter in all directions on a flat impervious surface;
- Rural conditions were conservatively assumed to reduce dispersion.

Based on these assumptions, RMPComp estimated that the toxic endpoint would be 0.1 mile (528 feet) from the ammonia tank. Since biogas engines typically have back-up flare systems, it was assumed that the ICEs would not be sited near the property boundaries. However, based on a survey of biogas facilities, several facilities were found to have biogas engines within 0.1 mile of the property line. Therefore, in the event of an accidental release of ammonia from an ammonia storage tank at affected biogas facilities, offsite receptors could be exposed to ammonia concentrations exceed the ERPG 2 for ammonia, 150 ppm.

According to the American Institute of Chemical Engineers (AIChE) Center for Chemical Process Safety[15], the mean time to catastrophic failure for a metallic storage vessel at atmospheric pressure is 0.985 per million hours (approximately once per 112 years). For aqueous ammonia tanks used at power plants, the California Energy Commission concluded that the catastrophic failure of an aqueous ammonia storage tank is an extremely unlikely event because the probability of a complete tank failure is insignificant, and the risk of failure due to other causes such as external events and human error also is insignificant. In addition, SCAQMD staff is not aware of any aqueous ammonia storage tank that has had a catastrophic failure in recent history. As a result, the likelihood of a rupture of the aqueous ammonia storage tank occurring is extremely low. In spite of this, however, hazard impacts from exposure to ERPG 2 concentrations of ammonia are considered to be significant.

PROJECT-SPECIFIC MITIGATION - AMMONIA TANK RUPTURE ON-SITE: In the event of an accidental release of ammonia from on-site ammonia storage units, potentially significant adverse hazard impacts from exposure to could occur, even if aqueous ammonia is used rather than anhydrous ammonia. Therefore, since hazard impacts pertaining to on-site ammonia tank rupture are expected to be significant, mitigation measures are required. To mitigate potential adverse hazardous impacts from exposure to an accidental release of ammonia, mitigation for the storage of aqueous ammonia would be to require the construction of a combined delivery and storage aqueous ammonia system equipped with the following.

HZ-7: Install safety devices, including but not limited to: continuous tank level monitors (e.g., high and low level), temperature and pressure monitors, leak monitoring and detection system, alarms, check valves, and emergency block valves.

HZ-8: Install secondary containment to capture 110 percent of the storage tank volume in the event of a spill:

15 AIChE, Guidelines for Process Equipment Reliability Data with Data Tables, Center for Chemical Process Safety 1989.

HZ-9: Install a grating-covered trench around the perimeter of the delivery bay to passively contain potential spills from the tanker truck during the transfer of aqueous ammonia from the delivery truck to the storage facility.

HZ-10: The truck loading/unloading area was designed to be equipped with an underground gravity drain that flows to a large on-site retention basin to provide sufficient ammonia dilution to the extent that no hazards impact is possible in the event of an accidental release during transfer of aqueous ammonia.

REMAINING IMPACTS – AMMONIA TANK RUPTURE ON-SITE: The hazard impacts associated with the potential for an ammonia tank rupturing on-site and causing a release are expected to be significant prior to mitigation. However, requiring the construction of a combined delivery and storage aqueous ammonia system with specific design features to capture any release of aqueous ammonia is considered to be feasible mitigation. Thus, after mitigation, no remaining significant impacts pertaining to on-site ammonia tank rupture hazards are expected.

4.4.4.4 Use of Catalysts

PROJECT-SPECIFIC IMPACTS – USE OF CATALYSTS: Implementing various control measures proposed in the 2012 AQMP could result in the increased use of catalysts as well an increase in the quantity of catalyst disposed of hazardous materials: 1) in SCRs per Control Measure CMB-01; 2) in NOx reducing additives (which are made of catalysts) per Control Measures CMB-01 and INC-01; and 3) in thermal oxidizers per Control Measures CMB-01, OFFRD-03, OFFRD-04, ADV-04, ADV-05, and FUG-01.

Catalysts Used in SCRs: There are two main types of catalysts used in SCRs: one in which the catalyst is coated onto a metal structure and a ceramic-based catalyst onto which the catalyst components are calcified. Commercial catalysts used in SCRs are available in two types of solid, block configurations or modules, plate or honeycomb type, and are comprised of a base material of titanium dioxide (TiO2) that is coated with either tungsten trioxide (WO3), molybdic anhydride (MoO3), vanadium pentoxide (V2O5), or iron oxide (Fe2O3). These catalysts are used for SCRs because of their high activity, insensitivity to sulfur in the exhaust, and useful life span of approximately five years. Ultimately, the material composition of the catalyst is dependent upon the application and flue gas conditions such as gas composition, temperature, et cetera. A typical catalyst dimension would be approximately 39" x 40" x 12" enclosed in 5" double-wall shell containing insulation. The number of catalyst blocks needed will depend on the quantity of flue gas being treated by the SCR.

The key hazards associated with catalyst use in SCRS are the crushing of the spent catalyst modules and transporting it for disposal or recycling. With respect to hazards and hazardous materials, this means that there will be an increase in the frequency of truck transportation trips to remove the spent catalyst as hazardous materials or hazardous waste from each affected facility. However, facilities that have existing catalyst-based operations currently recycle the catalysts blocks, in lieu of disposal. Moreover, due to the heavy metal content and relatively high cost of catalysts, recycling can be more lucrative than disposal. Thus, facilities that have existing SCR units and choose to employ additional SCR equipment, in most cases already recycle the spent catalyst and subsequently may continue to do so with any additional catalyst that may be needed.

A number of physical or chemical properties may cause a substance to be hazardous, including toxicity (health), flammability, reactivity, and any other specific hazard such as corrosivity or radioactivity. Based on a hazard rating from 0 to 4 (0 = no hazard; 4 = extreme hazard) located on the MSDS, the hazard rating for silica/alumina catalyst, for example, health is rated 1 (slightly hazardous), flammability is rated 0 (none) and reactivity is rated 0 (none). However, if nickel is deposited on the catalyst, the hazard rating is 2 for health (moderately toxic), 4 (extreme fire hazard) for flammability, 1 for reactivity (slightly hazardous if heated or exposed to water). The particular composition of the catalyst used in the SCR units, combined with the metals content of the flue gas will determine the hazard rating and whether the spent catalyst is considered a hazardous material or hazardous waste. This distinction is important because a spent catalyst that qualifies as a hazardous material could be recycled or reused by another industry (such as in the manufacturing of California Portland cement). However, spent catalyst that is considered hazardous waste must be disposed of in a Class III landfill. Due to the recycling of catalysts, less than significant impacts on hazards and hazardous waste are expected. Refer to Subchapter 4.8 - Solid and Hazardous Waste for a discussion on the disposal of spent catalyst modules.

<u>Use of NOx Reducing Additives:</u> SCONOx/EMx™ technology is a relatively new proprietary post-combustion catalytic oxidation and adsorption process that is undergoing development for controlling NOx and CO emissions from boiler, steam generator, and process heater applications. The catalyst used in the SCONOx/EMx™ system consists of a platinum base with a potassium carbonate adsorption coating over a ceramic substrate and has a catalyst life of three years that is guaranteed by the manufacturer. The catalyst simultaneously oxidizes NO to NO2, CO to CO2, and VOCs to CO2 and water. The NO2 is adsorbed onto the catalyst surface where it is chemically converted to potassium nitrates and nitrites. The catalyst is then exposed to hydrogen gas produced from reformed natural gas with high pressure steam to regenerate the adsorption layer. Because hydrogen is used for the catalyst regeneration process, a low oxygen atmosphere is necessary to prevent dilution. As such, the catalyst bed is designed with multiple compartments that are equipped with dampers that close at the beginning of the regeneration cycle. The catalyst used in the SCONOx/EMx™ process has a life-span of approximately three years

As with catalysts used in SCRs, the key hazards associated with post-catalytic oxidation are associated with the crushing of the spent catalyst and transporting it for disposal or recycling. With respect to hazards and hazardous materials, this means that there will be an increase in the frequency of truck transportation trips to remove the spent catalyst as hazardous materials or hazardous waste from each affected facility. However, due to the high value of platinum (a precious metal), facilities employing post-catalytic oxidation will likely recycle the catalyst, in lieu of disposal, so little hazardous waste would be expected to be and disposed of at a hazardous waste landfill. Thus, due to the recycling of catalysts used in post-combustion catalytic oxidation, less than significant impacts on hazards and hazardous waste are expected.

Catalyst Used in Thermal Oxidizers: The 2012 AQMP could result in the increased use of catalyst used in thermal oxidizers to control emissions. The following control measures could rely on catalytic oxidation technologies for emission control including CMB-01, OFFRD-03, OFFRD-04, ADV-04, and ADV-05. Catalytic oxidation beds in thermal oxidizers generally use a precious metal to aid in the combustion of air pollutants at relatively low temperatures. Thermal oxidizers require periodic replacement of the catalyst bed. The expected life of the catalyst is approximately three to five years, depending on the concentration of materials and type of exhaust flows controlled. Metals used in the catalyst are generally recovered because they are made from precious and valuable metals (e.g., platinum and palladium). Metals can be recovered from approximately 60 percent of the spent catalyst generated from the operation of catalytic oxidizers (SCAQMD, 2003a). These metals could then be recycled. The remaining material would most likely need to be handled as hazardous waste and disposed of at a hazardous waste landfill.

If the catalyst is not hazardous, jurisdiction for its disposal then shifts to local agencies such as regional water quality control boards or county environmental agencies. The RWQCB has indicated that if a spent catalyst is not considered a hazardous waste, it would probably be considered a Designated Waste. A Designated Waste is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state. The type of landfill that the material is disposed at will depend upon its final waste designation. Due to the recycling of catalysts used in catalytic oxidation and the fact that this technology is not expected to be widely used because of cost, less than significant impacts on hazards and hazardous waste are expected.

PROJECT-SPECIFIC MITIGATION – USE OF CATALYSTS: Less than significant impacts on hazards associated with the use of catalysts were identified so no mitigation measures are necessary or required.

REMAINING IMPACTS – USE OF CATALYSTS: The hazard impacts associated with the use of catalysts in various technologies are expected to be less than significant. Thus, no remaining hazard impacts associated with catalyst use are expected.

4.4.4.5 Start-up, Shutdown and Turnaround Procedures

PROJECT-SPECIFIC IMPACTS – START-UP, SHUTDOWN AND TURNAROUND PROCEDURES: The SCAQMD received a comment (see Comment 3-11 and Response to Comment 3-11) on the June 28, 2012 version of the NOP/IS asserting that implementation of Control Measure MCS-03 as proposed in the 2012 AQMP could result in the increased safety issues when diverting or eliminating process streams that are vented to flares, and installing redundant equipment to increase operational reliability during start-up, shutdown and turnarounds of process units. The comment, however, did not identify specify the safety issues of concern. Currently, SCAQMD Rule 1123 - Refinery Process Turnarounds, contains specific exemptions in the rule language that address (and prevent) situations that could potentially damage equipment, cause the malfunction of pollution control or safety devices, or cause violations of safety regulations. As with all control measures and the rule development process, participation by the affected parties, including the refineries and their representatives, as well as other industries and their representatives, will be paramount in effectively and safely implementing MCS-03.

In its current form, MCS-03 is in its early stages and is very broad and there is insufficient information to be able to identify specific equipment or processes. Start-up, shutdown or turnaround often results in higher emission rates from pieces of equipment that are interconnected, either upstream or downstream, to the equipment undergoing start-up/shutdown. Refinery operations, for example, typically rely on flares to minimize the emissions impact resulting from start-up, shutdown and turnarounds. However, there are adverse environmental impacts associated with the use of flares as well. As a result, there is the potential that MCS-03 could reduce potential hazard impacts, at least at some types of facilities.

As such, to identify any impacts at this time without knowing the specific design features would be speculative. This measure would be implemented in two phases, beginning with a technical assessment to be completed in the 2012/2013 timeframe. Once the technical assessment is completed, phase 2 would include implementing MCS-03 begins, and if a proposed rule or rule amendment is developed as a result, the CEQA document for the proposed rule or rule amendment will identify and analyze the specific environmental impacts at that time.

In conclusion, due to the speculative nature of the potential safety hazards that may be associated with implementing Control Measure MCS-03, no safety hazards can be identified at this time. Thus, no hazard impacts associated with the safety of implementing start-up, shutdown, and turnaround procedures are expected.

PROJECT-SPECIFIC MITIGATION – START-UP, SHUTDOWN AND TURNAROUND PROCEDURES: No impacts on hazards associated with safety issues pertaining to implementing Control Measure MCS-03 were identified so no mitigation measures are necessary or required.

REMAINING IMPACTS – START-UP, SHUTDOWN AND TURNAROUND PROCEDURES: No remaining hazard impacts associated with safety issues pertaining to implementing Control Measure MCS-03 are expected.

4.4.5 Summary of Hazards and Hazardous Materials Impacts

The following is the summary of the conclusions of the analysis of hazard impacts associated with implementation of the 2012 AQMP.

- Reformulated Products: The analysis indicates that the fire hazard impacts associated with reformulated coatings, adhesives, solvents, lubricants, mold release, and consumer products are expected to be significant. While an increase of future compliant reformulated materials could be expected to result in a concurrent reduction in the amount of materials formulated with conventional solvents, the possibility exists that facilities currently using water-based products could switch to using reformulated solvent-based products made with acetone or other flammable or extremely flammable chemicals. The analysis also indicates that the health hazard impacts associated with reformulated coatings, adhesives, solvents, lubricants, mold release, and consumer products are expected to be less than significant because even if manufacturers could potentially use replacement chemicals that could pose new or different health risks, SCAQMD Rule 1401 and 1402 would limit potential exposures to nearby receptors. Further, as with the use of all chemicals, conventional or reformulated, facilities and their workers would be required to continue to comply with existing health protective procedures when handling both flammable and toxic materials.

- Use of Alternative Fuels: The hazard impacts associated with the use of all alternative fuels except LNG and the use of batteries in electric/hybrid vehicles due to implementation of the 2012 AQMP control measures were determined to be less than significant when users comply with existing regulations and recommended safety procedures. Hazard impacts associated with the transportation of LNG were determined to be significant, requiring mitigation. Further, significant hazards impacts due to LNG transportation were determined to remain significant after mitigation. Lastly, any increase in the use of alternative fuels will result in a concurrent decrease in the amount of conventional fuels used in the district.

- Ammonia Use in SCRs and SNCRs: The use of ammonia in SCR and SNCR technologies could be potentially significant due to implementation of the control measures. While the use of aqueous ammonia at concentrations less than 20 percent by volume is expected to reduce hazard impacts associated with ammonia use, the potential for an on-site spill of aqueous ammonia could pose a significant hazards impact. Accordingly, significant hazard impacts are expected from the increased use of ammonia in SCR and SNCR technologies and mitigation measures are required.

- Start-up, Shutdown and Turnaround Procedures: No hazard impacts to pertaining to safety issues associated with implementing Control Measure MCS-03 were identified.

- Use of Catalysts: The analysis indicates that the hazard impacts associated with the use catalysts are expected to be less than significant.

Summary of PM2.5 Control Measure Impacts: The hazard impacts associated with PM2.5 Control Measures (CMB-01, IND-01, and MCS-01) were evaluated and determined to be less than significant for reformulated coatings, adhesives, solvents, lubricants, mold release, and consumer products; alternative fuels; ammonia use in SCRs, and fuel additives.

Summary of Ozone Control Measure Impacts: The hazard impacts associated with the Ozone Control Measures (21 control measures, see Table 4.4-1) were evaluated and determined to be less than significant for reformulated coatings, adhesives, solvents, lubricants, mold release, and consumer products; all alternative fuels except LNG, and start-up, shutdown and turnaround procedures. Significant hazards impacts due to LNG transportation were determined to remain significant after mitigation.

SUBCHAPTER 4.5

HYDROLOGY AND WATER QUALITY

4.5 HYDROLOGY AND WATER QUALITY

4.5.1 Introduction

This subchapter identifies potential hydrology and water quality impacts that may be generated by implementing the 2012 AQMP. Some of the control measures in the 2012 AQMP may result in impacts on water quality and increased wastewater discharge; water quality impacts associated with the use of alternative fuels; water quality impacts associated with increased use of batteries; increased water demand; and, water quality impacts associated with the use and application of sodium bisulfate for livestock operations.

4.5.2 2012 AQMP Control Measures with Potential Hydrology and Water Quality Impacts

The hydrology and water quality analysis in this Program EIR identifies the potential hydrology and water quality impacts from implementing the 2012 AQMP. All control measures were analyzed to identify the potential hydrology and water quality impacts. The NOP/IS determined that the proposed project could result in potentially significant water quality and water demand impacts.

The evaluation of the control measures was based on an examination of the impacts of the control measures and technologies. The evaluation of the control methods indicate that there are 34 control measures that could have potential water quality and water demand impacts. As shown in Table 4.5-1, four control measures for PM2.5 emission reductions and 21 control measures for reduction of ozone precursors were identified as having potential hydrology and water quality impacts.

TABLE 4.5-1

Control Measures with Potential Secondary Hydrology and Water Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	WATER IMPACT
SHORT-TERM PM2.5 CONTROL MEASURES			
BCM-03 (*formerly BCM-05*)	Further PM Reductions from Under-Fired Charbroilers (PM2.5)	Add-On Control Equipment with Ventilation Hood Requirements (e.g., ESPs, HEPA filters, wet scrubbers, or thermal oxidizers).	Potential impacts on water demand and wastewater discharge from operating wet ESPs or wet scrubbers.
BCM-04	Further Ammonia Reductions from Livestock Waste	Reducing pH level in manure through the application of acidifier sodium bisulfate.	Potential water quality impacts from applying acidifier sodium bisulfate.
IND-01[a]	Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities	Environmental lease conditions, port rules, tariffs or incentives.	Potential impacts on water demand and wastewater discharge from operating wet ESPs or wet scrubbers. Use of alternative fuels can result in water quality impacts.

TABLE 4.5-1 (Continued)

Control Measures with Potential Secondary Hydrology and Water Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	WATER IMPACT
SHORT-TERM PM2.5 CONTROL MEASURES			
MCS-01[a]	Application of All Feasible Measures	SCAQMD~~District~~ would adopt and implement new retrofit technology control standards as new BARCT standards become available.	Potential impacts on water demand and wastewater discharge from operating wet ESPs or wet scrubbers, use of alternative fuels can result in water quality impacts, increase water demand and wastewater discharges from increased use of water-based formulations.
OZONE CONTROL MEASURES			
CTS-01	Further VOC Reductions from Architectural Coatings (Rule 1113) (VOC)	Reduce the allowable VOC content in product formulations by using alternative low-VOC products and use application techniques with greater transfer efficiency.	Potential impact on water demand and wastewater discharge associated with increased use of water-based formulations.
CTS-02	Further Emission Reduction from Miscellaneous Coatings, Adhesives, Solvents and Lubricants (VOC)	Reduce the allowable VOC content in product formulations by using alternative low-VOC products or non-VOC products/equipment.	Potential impact on water demand and wastewater discharge associated with increased use of water-based formulations.
CTS-03	Further VOC Reductions from Mold Release Products (VOC)	Limitation of VOC content for mold release products.	Potential impact on water demand and wastewater discharge associated with increased use of water-based formulations.
CTS-04	Further VOC Reductions from Consumer Products (VOC)	Eliminate or revise the exemption for low vapor pressure solvents in consumer products.	Potential impact on water demand and wastewater discharge associated with increased use of water-based formulations.
FUG-01	~~Further~~ VOC Reductions from Vacuum Trucks (VOC)	VOC control devices such as carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers, liquid scrubbers and positive displacement (PD) pumps.	Increased water demand and increased wastewater discharge associated with air pollution control equipment (e.g., wet scrubbers).
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles (NOx)	Incentives to replace older vehicles with electric or hybrid vehicles.	Use of alternative fuels can result in water quality impacts.
ONRD-02	Accelerated Retirement of Older Light-Duty and Medium-Duty Vehicles (NOx)	Incentives to replace older light- and medium-duty vehicles with new or newer low-emitting vehicles.	Use of alternative fuels can result in water quality impacts.

TABLE 4.5-1 (Continued)

Control Measures with Potential Secondary Hydrology and Water Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	WATER IMPACT
OZONE CONTROL MEASURES			
ONRD-03	Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium Heavy-Duty Vehicles (NOx)	Incentives to replace older medium-duty vehicles with low-emitting vehicles. Highest priority would be given to zero-emission vehicles and hybrid vehicles with a portion of their operation in an “all electric range” mode.	Use of alternative fuels can result in water quality impacts.
ONRD-04	Accelerated Retirement of Older Heavy-Duty Vehicles (NOx)	Incentives replace heavy-duty vehicles with newer or new vehicles. Priority would be placed on replacing older diesel trucks in Mira Loma.	Use of alternative fuels can result in water quality impacts.
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards (NOx, PM)	Incentives to replace up to 1,000 heavy-duty vehicles with low-emitting vehicles or zero-emission container movement systems.	Use of alternative fuels can result in water quality impacts.
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment (NOx)	Accelerate Tier 0 and Tier 1 equipment replacement with Tier 4 equipment, use of air pollution control technologies (e.g., advanced fuel injection, air induction, and after-treatment technologies).	Use of alternative fuels can result in water quality impacts.
OFFRD-02	Further Emission Reductions from Freight Locomotives (NOx)	Replace existing engines (Tier 0 and Tier 2 engines) with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Accidental release of ammonia and use of alternative fuels can result in water quality impacts; accidental release issues with acid spill from batteries could affect water quality.
OFFRD-03	Further Emission Reductions from Passenger Locomotives (NOx)	Repower existing Tier 0 and Tier 2 engines with Tier 4 engines with control equipment (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Accidental release of ammonia and use of alternative fuels can result in water quality impacts; accidental release issues with acid spill from batteries could affect water quality.
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels at Berth	Shore power of vessels at berth, use of air pollution control technologies on exhaust gases from auxiliary engines and boilers (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Accidental release of ammonia and use of alternative fuels can result in water quality impacts; accidental release issues with acid spill from batteries could affect water quality.

TABLE 4.5-1 (Concluded)

Control Measures with Potential Secondary Hydrology and Water Quality Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	WATER IMPACT
OZONE CONTROL MEASURES			
ADV-01	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles (NOx)	Construct "wayside" electric or magnetic infrastructure; construct battery charging and fueling infrastructure. Alternatively, if battery, fuel cell or other zero/near zero emission technologies progress sufficiently, the need for wayside power for rail or trucks may be diminished or eliminated.	Use of alternative fuels can result in water quality impacts, potential water quality impacts from EV battery disposal.
ADV-02	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives (NOx)	Construct "wayside" electric, magnetic, battery-hybrid system, or fuel cell infrastructure, construct battery charging or fueling infrastructure.	Use of alternative fuels can result in water quality impacts, potential water quality impacts from EV battery disposal.
ADV-03	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment (NOx)	Construct electric gantry cranes, construct battery charging or fueling infrastructure, and use of alternative fuels.	Use of alternative fuels can result in water quality impacts, potential water quality impacts from EV battery disposal.
ADV-04	Actions for the Deployment of Cleaner Commercial Harborcraft (NOx)	Construct battery charging or fueling infrastructure, use of air pollution control equipment (e.g., SCR, and use of alternative fuels).	Use of alternative fuels can result in water quality impacts, potential water quality impacts from EV battery disposal.
ADV-05	Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels [NOx]	Employ aftertreatment control technologies such as SCR and sea water scrubbers, and use of alternative fuels.	Use of alternative fuels can result in water quality impacts, potential increased water demand and wastewater discharge associated with wet scrubbers.
ADV-06	Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment [NOx]	Construct battery charging or fueling infrastructure, and increased use of alternative fuels.	Use of alternative fuels can result in water quality impacts, potential water quality impacts from EV battery disposal.
ADV-07	Proposed Implementation Measures for the Deployment of Cleaner Aircraft Engines(NOx)	Use alternative fuels, lean combustion burners, high rate turbo bypass, advanced turbo-compressor design, and engine weight reduction.	Use of alternative fuels can result in water quality impacts.

a The specific actions associated with the control measure are unknown and, therefore, the impacts are speculative. In order to provide a conservative analysis, it is assumed that the control measure could require air pollution control technologies that are similar to those that are currently required (e.g., SCR, electrification, use of alternative fuels, etc.), and would have the potential to require construction activities that would generate noise.

4.5.3 Significance Criteria

Potential impacts on water resources will be considered significant if any of the following criteria apply:

Water Demand:

- The existing water supply does not have the capacity to meet the increased demands of the project, or the project would use more than 262,820 gallons per day of potable water.
- The project increases total demand for water by more than five million gallons per day.

Water Quality:

- The project will cause degradation or depletion of ground water resources substantially affecting current or future uses.
- The project will cause the degradation of surface water substantially affecting current or future uses.
- The project will result in a violation of National Pollutant Discharge Elimination System (NPDES) permit requirements.
- The capacities of existing or proposed wastewater treatment facilities and the sanitary sewer system are not sufficient to meet the needs of the project.
- The project results in substantial increases in the area of impervious surfaces, such that interference with groundwater recharge efforts occurs.
- The project results in alterations to the course or flow of floodwaters.

4.5.4 Potential Hydrology and Water Quality Impacts and Mitigation Measures

4.5.4.1 Wastewater and Water Quality Impacts

4.5.4.1.1 Wastewater Impacts

PROJECT-SPECIFIC IMPACTS - WASTEWATER: The 2012 AQMP control measures that could require reformulation of coatings, adhesives, solvents, lubricants, mold release agents, and consumer products are MCS-01, CTS-01, CTS-02, CTS-03, and CTS-04. Emission reductions are expected to be achieved through the use of low or zero VOC formulations and reformulation of these materials may generate additional wastewater.

In addition, the 2012 AQMP includes stationary sources that may require add-on control equipment with the potential to generate additional wastewater (BCM-03, BCM-04, IND-01, MCS-01, FUG-01) associated with the use of wet electrostatic precipitators (ESPs) or wet gas scrubbers (WGS). The extent of the use of these types of control equipment is unknown. However, the use of wet ESPs and WGSs has been shown to be effective at reducing PM2.5 emissions and is a potential control methodology.

To meet the lowered future VOC content limits as a result of implementing Control Measures MCS-01, CTS-01, CTS-02, CTS-03, and CTS-04, coatings, adhesives, solvents, lubricants, mold release products, and consumer products are expected to be reformulated. While reformulated products would be expected to have lower VOC contents, the reformulations could have widely varying compositions depending on the chemical characteristics of the replacement solvents chosen. For example, most reformulations are expected to be made with water, but other reformulations could be made with an exempt solvent such as acetone or other solvents that are not exempted from the definition of a VOC in SCAQMD's Rule 102. As a result, for those products reformulated with water, then water would also be used for clean-up and the resultant wastewater material could be disposed of into the public sewer system. Further, other reformulated products made with exempt or non-exempt solvents may also lead to adverse impacts to water resources if clean-up and disposal of reformulated solvents, coatings or products are not handled properly. However, the use of water to reformulate coatings, solvents and products would generally lead to products that would be less toxic than products reformulated with either exempt or non-exempt chemicals (that are typically petroleum-based) and as such, generate fewer impacts to water quality. Lastly, because the development of reformulated products is expected to require the same types of equipment (e.g., spray guns, rollers, and brushes) currently used in coating operations, the corresponding clean-up practices employed to clean the coating equipment would also not be expected to change.

Table 4.5-2 estimates the "worst-case" potential increase of wastewater likely to be received by wastewater treatment plants in the district as a result of the implementing the 2012 AQMP control measures that pertain to product reformulations. The estimated increase in wastewater generated is considered to be within the projected capacity of the local wastewater treatment plants within the district. Wastewater generated from the reformulation of coatings and products is estimated to be about 47,000 gallons per day as compared to the estimated wastewater treatment capacity of about 2,370 million gallons in the district. These are expected to be "worst-case" estimates because a number of these materials are already in use are water-borne or low VOC materials. For example, most architectural coatings are already being sold with VOC content limits but Control Measure CTS-01 would further reduce the allowable VOC content from coatings that are already regulated. (The control measure may also require increased transfer efficiency of the coating equipment but no change in the formulation of coatings would be expected.) Further, low VOC mold release products are already being manufactured and sold, so the need for reformulation may be minor or not required at all, depending on the manufacturer.

TABLE 4.5-2

Projected Wastewater Impact from 2012 AQMP Control Measures

Control Measure	POTW Average Wastewater Flow[a] (million gal per day)	POTW Treatment Capacity[a] (million gal per day)	Estimated Affected Coating Usage (gal per year)	Projected Wastewater Flow (gallon per year)	Projected Wastewater Flow (gallons per day)	Total Impacts, Percent of POTW Average Daily Flow
CTS-01 Architectural Coatings	1,536	2,370	7,610,000[b]	7,610,000	20,849	0.001
CTS-02 Misc. Coatings, Adhesives, Solvents, Lubricants	1,536	2,370	3,805,000	3,805,000	10,425	0.0007
CTS-03 Mold Release Products	1,536	2,370	1,902,500	1,902,500	5,212	0.0003
CTS-04 Consumer Products	1,536	2,370	3,805,000	3,805,000	10,425	0.0007
Total Wastewater from Reformulated Coatings:			17,122,500	17,122,500	46,911	0.003
BCM-03, BCM-04, IND-09, and MSC-01	1,536	2,370	--	--	2,016,000	0.131
Total for all Control Measures:					2,062,911	0.134

a See Table 3.5-3.

b SCAQMD, 2011. Assume 2004 volume to account for decline in economic activity in Southern California.

c Architectural coatings are the largest coating category. This number represents the total universe of coating categories; however, it is likely that the control measure would only affect a small subset of the total number of coating categories. Miscellaneous Coatings, Consumer products and Consumer Products are assumed to be about 50 percent of the volume of architectural coatings, and mold release products are assumed to be about 25 percent of the volume of architectural coatings.

d Assumes 20 large wet ESPs/WGSs are installed as part of the AQMP.

As indicated in Table 4.5-1, several control measures proposed in the 2012 AQMP may require add-on control equipment (BCM-03, BCM-04, IND-01, and MSC-01) for stationary sources such as wet ESPs and WGSs, which have been shown to be effective at reducing PM2.5 emissions. If installed, wet ESPs and WGSs would require water to operate and thus, would result in the generation of wastewater. However, the extent of the use of these types of control equipment to be used in the future is unknown.

One wet ESP with one WGS were installed on the Fluid Catalytic Cracking Unit (FCCU) at the ConocoPhillips Refinery to reduce SOx emissions, as well as PM10 and PM2.5 emissions. The FCCU is a large source of emissions and the wet ESP and WGS installed were sized accordingly. The environmental analysis for this project indicated that the expected wastewater discharge from the combined operation of the wet ESP and WGS at ConocoPhillips was about 70 gallons per minute (about 100,800 gallons per day) (SCAQMD, 2007). Wet ESPs and WGSs of this size are primarily designed for large sources within the district (e.g., refineries and other large manufacturing facilities), but these technologies can also be scaled down for use on smaller sources. If the 2012 AQMP control measures encourage the installation of 20 additional wet ESP /WGS systems of this size, about two million gallons per day of wastewater would be generated. Wastewater from larger facilities such as refineries is often treated at existing wastewater treatment facilities operated by the facility, so increased wastewater may not be discharged to publicly owned treatment facilities. However, making the conservative assumption that the 2012 AQMP could result in the construction and installation of 20 large-scale wet ESP/WGS systems, the estimated increase in wastewater would be well within the existing wastewater treatment capacity within the district.

The potential increase in the volume of wastewater estimated as a result of implementing these control measures in the 2012 AQMP is also included in Table 4.5-2. The total increase in potential wastewater from implementing all of the control measures is estimated to be about 2.1 million gallons per day, which represents about a 0.1 percent increase in wastewater generated within the district. Further, the increase in wastewater is well within the capacity of the existing wastewater treatment plants of about 2,370 million gallons. Therefore, the wastewater impacts associated with the 2012 AQMP are expected to be less than significant.

PROJECT-SPECIFIC MITIGATION - WASTEWATER: Less than significant impacts on wastewater generation as a result of implementing the 2012 AQMP are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS - WASTEWATER: The wastewater impacts associated with wastewater generation are expected to be less than significant. Thus, no remaining wastewater impacts are expected.

4.5.4.1.2 Water Quality Impacts

PROJECT-SPECIFIC IMPACTS – WATER QUALITY: In the past, concerns have been raised that the increased use of waterborne technologies to meet the lower VOC content limits would result in a greater trend of coating applicators to improperly dispose of the waste generated from these coatings into the ground, storm drains, or sewers systems. However, there is no data to support this contention.

Results from a survey of contractors conducted by the SCAQMD for the November 1996 amendments to SCAQMD Rule 1113 determined that a majority of coating applicators either dispose of the waste material properly as required by the coating manufacturer's MSDS or recycle the waste material regardless of type of coating[1].

[1] SCAQMD, Final Subsequent Environmental Assessment, SCAQMD No. 960626DWS, October 1996.

The survey was prepared to evaluate the replacement of solvent-borne coatings with reformulated, water-borne coatings. In November 2008, a paint manufacture conducted a survey of 180 Southern California residential and professional painters. The conclusion was that a majority professional painters use hazardous waste disposal services to dispose of coatings instead of air drying coatings and then disposing of as a solid waste. Based upon the survey results, there is no reason to expect that coating contractors would change their disposal practices, especially those contractors that already dispose of wastes properly. Similarly, there is also no evidence that there would be an increase in illegal disposal practices as a result of the proposed control measures.

Potential adverse water quality impacts associated with reformulated products are expected to be minimal since: 1) compliance with state and federal waste disposal regulations would substantially limit adverse impacts; 2) "turn-key" services are available for aqueous (water-based) cleaners; 3) some solvent cleaning operators may currently be disposing of spent material illegally, so one illegal activity would be replaced with another legal activity; and, 4) the amount of wastewater which may be generated from reformulated solvents and from air pollution control equipment is well within the projected receiving capacity of the Publicly Owned Treatment Works (POTWs) in the SCAQMD's jurisdiction. The treatment of wastewater at POTWs is accomplished under the control of numerous regulatory permits (e.g., National Pollutant Discharge Elimination System Permits or NPDES Permits) which require monitoring of the quality of wastewater on a frequent basis. For example, NPDES permit requirements for a local refinery requires monthly sampling for arsenic, cadmium, chromium, copper, cyanides, lead, mercury, nickel, zinc, silver, total phenol, pH, dissolved sulfides, chlorides, suspended solids, chemical oxygen demand, biochemical oxygen demand and ignitability. Daily sampling is required for ammonia, oil and grease, selenium and thiosulfate.

Since the reformulation of materials or additional use of air pollution control equipment is not expected to generate significant adverse water quality impacts industry-wide, no changes to existing wastewater treatment permits are expected to be required. As a result, it is expected that operators of affected facilities would continue to comply with existing wastewater treatment requirements of the applicable Regional Water Quality Control Boards or sanitation district.

Coating operations currently generate wastewater as part of clean-up activities. In addition, industrial operations that would be expected to use wet ESP/WGS systems are likely to also be large manufacturing facilities that currently generate wastewater. As discussed above, the reformulation of coatings to water-based coatings could have a beneficial effect by reducing the levels of contaminants currently found in the wastewater from these operations because there is an increasing trend toward less toxic waterborne coatings as water-based products are generally less toxic than solvent-based products. The amount of increased wastewater generated from coating operations would be well within the capacity of the region's POTWs. Consequently, water quality impacts from the 2012 AQMP control measures are not considered significant.

PROJECT-SPECIFIC MITIGATION - WATER QUALITY: Less than significant impacts on water quality as a result of implementing the 2012 AQMP are expected so no mitigation measures are necessary or required.

REMAINING IMPACTS – WATER QUALITY: The water quality impacts associated with implementing the 2012 AQMP are expected to be less than significant. Thus, no remaining water quality impacts are expected.

4.5.4.2 Alternative Transportation Fuels

PROJECT-SPECIFIC IMPACTS – ALTERNATIVE TRANSPORTATION FUELS: The following control measures in the 2012 AQMP may contribute to the increased use of alternative fuels in the SCAQMD's jurisdiction: IND-01, MSC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07. These control measures would generally require the increased use of alternative fuels (e.g., biodiesel fuels, compressed natural gas, liquefied natural gas, and hydrogen).

The SCAQMD amended Rule 431.2 - Sulfur Content of Liquid Fuels, in September 2000, which limited the sulfur content in diesel fuel used in stationary sources to 15 ppm by weight, effective January 1, 2005. Federal law extended this same requirement to also apply to diesel fuel used by mobile sources, effective June 1, 2006. Diesel fuels currently used in California are low sulfur fuels. As such, there is no evidence that the use of low sulfur diesel fuels has resulted in any water quality impacts, as the only difference in the fuel available on the market is the reduced concentration of sulfur.

In general, alternative fuels are expected to be less toxic than conventional fuels and follow a similar path as the low sulfur diesel. Biodiesel is a fuel derived from biological sources such as vegetable oils or animal fats. Biodiesel can be used pure or blended with conventional diesel. Because the biodiesel typically comes from vegetable oils or animal fats, it is generally less toxic and more biodegradable than conventional diesel, so the water quality impacts from a spill of biodiesel would be less than a spill of pure conventional diesel. The most common blended biodiesel is B20, which is 20 percent biodiesel and 80 percent conventional diesel. Therefore, the potential water quality impacts from the transport and storage of biodiesel and biodiesel blends is not expected to be substantially different than the transport and storage of conventional diesel.

The other types of alternative fuels that may be used as part of implementing some control measures in the 2012 AQMP include compressed natural gas, liquefied natural gas and hydrogen. Because all of these fuels exist as a gas at standard temperatures and pressures, a leak of any of these fuels would result in an airborne release, and not a release that could adversely affect water and water quality. There are a number of rules and regulations currently in place that are designed to minimize the potential impacts from underground leaking storage tanks and spills from fueling activities, including requirements for the construction of the storage tanks, requirements for double containment, and installation of leak detection systems. These regulations would also apply to any leaks of alternative fuels from storage tanks. Thus, the use of alternative fuels is not expected to result in any greater adverse water quality impacts than the use of conventional fuels like diesel or gasoline.

Lastly, none of the alternative fuels require water for their processing or distribution. Thus, any increased use of alternative fuels will not create an additional demand for water.

PROJECT SPECIFIC MITIGATION - ALTERNATIVE TRANSPORTATION FUELS: Less than significant hydrology and water quality impacts were identified from the use of alternative fuels as part of the 2012 AQMP so no mitigation measures are required.

REMAINING IMPACTS – ALTERNATIVE TRANSPORTATION FUELS: The hydrology and water quality impacts associated with implementing the 2012 AQMP are expected to be less than significant. Thus, no remaining hydrology or water quality impacts are expected from the projected increased use of alternative fuels.

4.5.4.3 Electric Vehicles

PROJECT-SPECIFIC IMPACT – ELECTRIC VEHICLES: Implementation of the 2012 AQMP could contribute to an increased use of electric vehicles. Table 4.5-3 estimates the number of electric vehicles that are expected to be put into service as part of implementing Control Measures ONRD-01, ONRD-03, ONRD-04, and ONRD-05. In addition to the control measures identified in Table 4.5-3, a number of other control measures would encourage the use of zero and near-zero emission vehicles and other equipment including ADV-01, ADV-02, ADV-03, ADV-04, ADV-06, and ADV-07. Since some batteries contain toxic materials, water impacts are possible if they are disposed of in an unsafe manner, such as by illegal dumping or by disposal in a landfill.

TABLE 4.5-3

Estimated Increase in Electric Vehicles

CONTROL MEASURE NO.	CONTROL MEASURE DESCRIPTION	ESTIMATED INCREASE IN VEHICLES
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles	Incentivize 9,000 light- and medium-duty vehicles
ONRD-03	Accelerated Penetration of Partial Zero Emission and Aero Emission Medium Heavy-Duty Vehicles	Encourage introduction of 5,000 vehicles
ONRD-04	Accelerated Retirement of Older Heavy Duty Vehicles	Replace 5,000 vehicles
ONRD-05	Further Emission Reductions for Heavy-Duty Vehicles Serving Near-Dock Railyards	Replace 1,000 trucks with zero emission technologies

As interest in the use of electric vehicles has increased over the years, battery technologies have been developing and improving. Most battery technologies employ materials that are recyclable, since regulatory requirements and market forces encourage recycling. California laws create incentives and requirements for disposal of recycling of batteries as follows.

- Under CARB regulations, to certify either a new ZEV or retrofit an existing ZEV, automakers must complete CARB's certification application, which must include a battery disposal plan. Thus, current regulations require ZEV manufacturers to take account for the full life-cycle of car batteries and to plan for safe disposal or recycling of battery materials (SCAQMD, 2007). For example, Toyota offers $200 per battery to minimize illegal disposal of batteries.

- California law requires the recycling of lead-acid batteries (California Health & Safety Code §25215). Spent lead-acid batteries being reclaimed are regulated under 22 CCR §66266.80 and 66266.81, and 40 CFR part 266, Subpart G.

- California law requires state agencies to purchase car batteries made from recycled material (Public Resources Code §42440).

- As of February 8, 2006, household wastes such as batteries, electronic devices and fluorescent light bulbs may not be disposed of in a landfill by anyone.

Existing battery recovery and recycling programs have limited the disposal of batteries in landfills. For example, the recycling of lead-acid and nickel-cadmium batteries is already a well-established activity. Two secondary lead smelters (facilities that recycle lead-bearing materials) are located within the district. Both of these facilities receive spent lead-acid batteries and other lead bearing material and process them to recover lead and polypropylene (from the battery casings). Acid is collected and recycled as a neutralizing agent in the wastewater treatment system.

The availability of secondary lead smelters for battery recycling reduces the potential for the illegal disposal of batteries.

Implementation of the 2012 AQMP would be expected to result in an increased use of electric vehicles (EVs) and hybrid vehicles (hybrids) which use nickel-metal hydride (NiMh) and lithium ion (Li-ion) batteries, instead of lead-acid batteries. The most common battery technologies used in modern EVs and hybrids are NiMH and Li-ion batteries (Hybrid, 2008). EVs and hybrids both use electricity as part of their fuel system. EVs rely purely on electric power stored in batteries. Hybrids also use batteries as part of their fuel supply; however, hybrids supplement their electrical needs by using gasoline engines to generate either mechanical or electric power on demand. Since gasoline is a conventional fuel, any difference in water quality impacts associated with hybrid vehicles would be from the batteries. The electrolyte in NiMh batteries is an alkaline electrolyte, usually potassium hydroxide, the electrolyte in Li-ion batteries is a lithium salt in an organic solvent, while the electrolyte in lead-acid batteries is a sulfuric acid/water blend.

Batteries in hybrids are much larger than batteries in conventional vehicles. The current hybrid batteries weigh about 110 pounds and are composed of NiMH batteries which are charged by an internal combustion engine driven generator and/or by a regenerative braking system that captures power from deceleration and braking. These batteries have a longer life than conventional lead acid batteries. These high voltage batteries are warranteed for 10 years or 150,000 miles under California regulations.

The earliest Toyota Prius and Honda Insight and Civic cars were initially sold through the 2003 model year. The batteries associated with these vehicles are just reaching 10 years of age, so most of the battery waste from the first generation of hybrid vehicles has not yet been created. Two recycling firms that will recycle advanced-technology automotive batteries include North American Operations for Umicore, a Belgium-based metals recycling company, and Toxco, a ~~with~~ U.S. company with a number of facilities located throughout the country.

The NiMH batteries found in hybrid vehicles are basically "zero-landfill" products, meaning that whatever cannot be recycled is typically consumed in the recycling process. The primary metals recovered during recycling are nickel, copper and iron. Some principal rare earth metals, neodymium and lanthanum (Edmunds, 2012), are also recovered. Improper disposal of NiMH batteries poses less environmental hazard than that of lead-acid or nickel-cadmium batteries because of the absence of lead and cadmium, which are considered to be toxic. Most industrial nickel is recycled, due to the relatively easy retrieval of the magnetic element from scrap using electromagnets, and due to its high value.

Li-ion batteries are between 70 and 100 percent recyclable, depending on the particular chemistry of the batteries. There are approximately six different types of Li-ion batteries in use, and more are being developed. The battery types available are differentiated by the chemical formulation of the electrodes including, but not limited to, cobalt dioxide, nickel-cobalt-manganese (NCM), nickel-cobalt- aluminum (NCA), manganese oxide spinel (MnO), and iron phosphate (FePo). The components of Li-ion batteries that cannot be recycled are mostly consumed as fuel in the furnaces that are used to melt down the metals, which include cobalt, copper, iron, nickel, manganese and, in the future, lithium (Edmunds, 2012).

Because Li-ion batteries have a potential for after-automotive use, destructive recycling can be postponed for years even after an EV or hybrid battery can no longer hold and discharge sufficient electricity to power a car's motor, the battery pack can still carry a tremendous amount of energy. Battery manufacturers project that the battery packs will still be able to operate at approximately 80 percent of capacity at the time they must be retired from automotive use. Auto companies are partnering with battery, recycling and electronics firms to figure out and develop post-automotive markets and applications for Li-ion battery packs (Edmunds, 2012).

The switch to electric batteries has the potential to create water quality impacts from improper disposal. However, the increased use of EVs and hybrids will result in a decrease in the use of lead acid batteries, which use sulfuric acid/ blends as electrolytes and have a much shorter lifespan than NiMH or Li-ion batteries. NiMH and Li-ion batteries are generally recycled because the material within the batteries is valuable. Further some manufacturers offer incentives to prevent illegal disposal of the batteries. Toyota offers $200 per battery to help prevent improper disposal of hybrid batteries.

While the switch to electric batteries has the potential to create water quality impacts from improper disposal, increased use of EVs and HVs will result in a concomitant decrease in the use of internal combustion engines and a reduction in the impacts of such engines. For instance, decreased use of internal combustion engines such as gasoline- or diesel-burning engines will also result in a decreased generation of used engine oil since electric motors do not employ oil as a lubricant.

Specifically, approximately 294,500 tons per year of waste oil was generated in the Basin in 2011 and about 525,300 tons was generated in California in 2005 (see Chapter 3.6, Solid/Hazardous Waste). Because of the widespread use and volume of waste oil, a portion of waste oil is illegally disposed of via sewers, waterways, on land, and disposed of in landfills. Waste oil that is illegally disposed can contaminate the environment (via water, land or air). The CIWMB has estimated that about 20 million gallons of used motor oil is disposed each year in an unknown manner (CIWMB, 2007). In addition, a substantial amount of motor oil leaks onto the highways from vehicles each year. This motor oil is washed into storm drains and eventually ends up in the ocean.

Since electric motors do not require motor oil as a lubricant, replacing internal combustion engines with electric engines will eliminate the impacts of motor oil use and disposal. For example, a 50 percent penetration of light-duty electric vehicles will result in a corresponding 50 percent reduction in the release of these contaminants into the environment due to illegal disposal (50 percent of 20 million gallons is 10 million gallons). Release of contaminants due to engine oil that burns up in, or leaks from engines or due to burning of recovered engine oil for energy generation will also be correspondingly reduced. Additional use of electric vehicles is expected to have a beneficial environmental impact by reducing the amount of motor oil used, recycled, potentially illegally disposed, or washed into storm drains and ending up in the ocean.

In conclusion, the illegal disposal of electric batteries has the potential to result in significant water quality impacts by allowing toxic metals or acids to leach into surface or ground waters. However, most car batteries are recycled and EV and hybrid batteries are more valuable than lead-acid batteries, which increases the likelihood that these batteries will also be recycled. For this reason, virtually all of the EV and hybrid batteries will be recycled when compared to lead-acid batteries which do not have a comparable recycling value. Therefore, recycling of EV and hybrid batteries will be greater than for lead-acid batteries used in conventional vehicles, reducing the potential for illegal disposal and potential water quality impacts. Based on the foregoing analysis, less than significant adverse water quality impacts are expected from the increased use of EV and hybrid vehicles.

PROJECT-SPECIFIC MITIGATION – ELECTRIC VEHICLES: Less than significant hydrology/water quality impacts were identified from the increased use of electric vehicles as part of the 2012 AQMP so no mitigation measures are necessary or required.

REMAINING IMPACTS – ELECTRIC VEHICLES: The hydrology and water quality impacts associated with increased use of electric vehicles and hybrid vehicles are expected to be less than significant. Thus, no remaining hydrology or water quality impacts are expected from the projected increased use of these vehicles.

4.5.4.4 Water Demand Impacts

PROJECT-SPECIFIC IMPACT – AIR POLLUTION CONTROL EQUIPMENT: There are several control measures that may require or encourage the use of air pollution control technologies that could result in an increased use of water demand from condensers, carbon absorbers, wet scrubbers, and SCRs. As indicated in Table 4.5-1, the 2012 AQMP includes stationary sources that may require add-on control equipment with the potential to increasing water demand (BCM-03, BCM-04, IND-01, and MSC-01). The use of wet ESPs and WGSs would result in an increase in water demand. The extent of the use of these types of control equipment is unknown. However, the use of wet ESPs and WGSs has been shown to be effective at reducing PM2.5 emissions.

As mentioned earlier in this chapter, one wet ESP and one WGS were installed on the FCCU at the ConocoPhillips Refinery to control sulfur oxide emissions, as well as PM10 and PM2.5 emissions. The environmental analysis for this project indicated that the expected water demand associated with the WGS was about 300 gallon per minute (432,000 gallons per day) (SCAQMD, 2007). The increase in water use is greater than the significance threshold of 262,820 gallons of potable water per day. If the 2012 AQMP control measures were to encourage the development of 20 additional wet ESP/WGS systems of this size, the potential water demand would also exceed the five million gallon total water significance threshold. Therefore, the 2012 AQMP could result in potentially significant water demand impacts associated with wet ESP and WGS technologies.

The possible control methods for BCM-03 - Emission Reductions from Under-fired Charbroilers, have yet to be determined because cost-effective controls for the majority of under-fired charbroilers have not yet been developed. BCM-03 is focused on controlling PM10 and PM2.5 emissions; thus, water scrubbing or filtering devices could be employed as add on controls for charbroiler exhaust and these devices would require water for their operation. An alternative to these water-based control technologies is the replacement of under-fired charbroilers with a smokeless broiler, which would prevent grease from dripping onto hot burner components while cooking food. A smokeless broiler is estimated to result in a 75 percent reduction in PM10 emissions and a 71 percent reduction in VOC emissions. Thus, compliance with BCM-03 could be achieved by replacing older broilers with newer, more efficient broilers, which would not require water to operate.

Other types of control measures may have several control technology options to use for compliance, and these add-on control equipment options are generally not expected to result in a significant increase in water demand from their use. For example, particulate control devices such as baghouses and dry filters do not utilize water. These types of control technologies are likely to be used on smaller emission sources as they tend to be more cost effective than wet ESPs and WGSs.

Control Measure IND-01, a backstop measure for ports, could employ WGSs (which would require water to operate) for particulate control. However, IND-01 is expected to rely primarily on the use of a variety of other control methods that do not require water for operation, including cold ironing, alternative fuels, PM filters, et cetera. While there is a variety of add-on control technologies available, and not all of these technologies require water for their operation, implementation of some of the control measures proposed in the 2012 AQMP is expected to result in significant adverse water demand impacts in the event that wet ESP/WGS systems are installed on large emission sources. Table 4.5-4 contains a summary of the potential water demand associated with implementing Control Measures BCM-03, BCM-04, IND-01, and MSC-01.

PROJECT-SPECIFIC IMPACTS – REFORMULATED PRODUCTS: Historically, potential water demand to reformulate conventional coatings into waterborne coatings and to clean up waterborne coatings has not resulted in significant adverse impacts on water demand. Using "worst-case" assumptions, increase water demand from implementing the 2012 AQMP has been estimated in Table 4.5-4 for both manufacturers of waterborne coatings and water used by consumers to clean coating equipment. As shown in Table 4.5-4, water demand associated with the manufacture and clean-up of waterborne formulations is estimated to be 93,821 gallons per day. This increased water demand does not exceed the SCAQMD's significance thresholds of 5,000,000 gallons per day of total water demand or 262,820 gallons per day of potable water demand.

TABLE 4.5-4

Projected Water Demand from 2012 AQMP Control Measures

CONTROL MEASURE	PROJECTED WATER DEMAND[a] (BILLION GAL PER YEAR)	PROJECTED WATER DEMAND WITH 20% REDUCTION[b] (BILLION GAL PER YEAR)	ESTIMATED COATING SALES[c] (GAL PER YEAR)	PROJECTED MFGR WATER DEMAND, [d] FLOW (GAL PER YEAR)	PROJECTED CLEAN UP WATER DEMAND,[e] (GALLONS PER YEAR)	TOTAL IMPACT,[f] (GALLONS PER DAY)
CTS-01 Architectural Coatings	2,517	2,014	7,610,000	7,610,000	7,610,000	41,698
CTS-02 Misc. Coatings, Adhesives, Solvents, Lubricants	2,517	2,014	3,805,000	3,805,000	3,805,000	20,849
CTS-03 Mold Release Products	2,517	2,014	1,902,500	1,902,500	1,902,500	10,425
CTS-04 Consumer Products	2,517	2,014	3,805,000	3,805,000	3,805,000	20,849
Estimated Total Water Demand from CTS-01, CTS-02, CTS-03, and CTS-04 :			17,122,500	17,122,500	17,122,500	93,821
BCM-03, BCM-04, IND-09, and MSC-01	2,517	2,014	--	--	--	8,640,000[g]
Total Estimated Water Demand:						8,733,821

a See Table 3.5-1.

b On November 10, 2009, the state Legislature passed Senate Bill 7 as part of the Seventh Extraordinary Session referred to as SBX7-7. This new law is the water conservation component to the historic Delta legislative package, and seeks to achieve a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. The projected water demand was reduce by 20 percent pursuant to this legislation.

c Architectural coatings are the largest coating category. Miscellaneous Coatings, Consumer products and Consumer Products are assumed to be about 50 percent of the volume of architectural coatings, and mold release products are assumed to be about 25 percent of the volume of architectural coatings. (SCAQMD, 2011.)

d Assumes that one gallon of water would be used to manufacture one gallons of coating applied. This estimate includes the water used in humidifiers and for purging lines. This volume also assumes as "worst-case" scenario, that all affected coatings used in the district were manufactured here and does not take into consideration the fact that some affect coatings are already waterborne coatings

e Assumes that one gallon of water would be used to clean-up equipment for every gallon of coating applied.

f Total amount of manufactured and clean-up water demand.

g Assumes 20 large ESPs/WGS are installed as part of the AQMP.

PROJECT-SPECIFIC CONCLUSION – WATER DEMAND: The water demand associated with certain air pollution control technologies along with the water demand associated with the use of waterborne coatings could exceed 262,820 gallons per day of potable water demand and could potentially exceed the total water demand of five million gallons per day and is therefore, potentially significant. The source of water will vary from jurisdiction to jurisdiction but can include additional use of ground water resources. Most of the ground water basins used for water supply are managed to minimize and prevent overdraft conditions. The increased water demand is expected to be associated with existing sources within the Basin which already have water conveyance infrastructure. Therefore, the construction of new water conveyance infrastructure is not expected to be required.

PROJECT-SPECIFIC MITIGATION – WATER DEMAND: The mitigation measures that would be implemented for water demand impacts would depend on the characteristics of individual projects, the volume of water expected to be used, and could vary amongst jurisdictions. Typical mitigation measures are expected to include the following types of measures:

HWQ-1: Local water agencies should continue to evaluate future water demand and establish the necessary supply and infrastructure to meet that demand, as documented in their Urban Water Management Plans.

HWQ-2: Project sponsors should coordinate with the local water provider to ensure that existing or planned water supply and water conveyance facilities are capable of meeting water demand/pressure requirements. In accordance with State Law, a Water Supply Assessment should be required for projects that meet the size requirements specified in the regulations. In coordination with the local water provider, each project sponsor will identify specific on- and off-site improvements needed to ensure that impacts related to water supply and conveyance demand/pressure requirements are addressed prior to issuance of a certificate of occupancy. Water supply and conveyance demand/pressure clearance from the local water provider will be required at the time that a water connection permit application is submitted.

HWQ-3: Project sponsors should implement water conservation measures and use recycled water for appropriate end uses.

HWQ-4: Project sponsors should consult with the local water provider to identify feasible and reasonable measures to reduce water consumptions.

REMAINING IMPACTS – WATER DEMAND: The impacts of the proposed project on water demand are expected to be significant prior to mitigation. While generally the mitigation measures could help minimize some of the water demand, on an individual facility-basis, the availability of water supplies varies throughout the region, thus, not all mitigation measures will be applied in all situations. For this reason, the mitigation measures are not expected to fully eliminate the potential water demand impacts. Therefore, water demand impacts generated by the proposed project are expected to remain significant.

4.5.4.5 Application and Use of Sodium Bisulfate

PROJECT-SPECIFIC IMPACTS – SODIUM BISULFATE: Control Measure BCM-04 would control ammonia emissions from livestock operations through the application of sodium bisulfate (SBS). SBS is a hydroscopic salt that acts an acidifier. SBS has been used to reduce pH levels in dairy bedding (e.g., hay or straw) and manure, which in turn reduces bacterial and ammonia levels. In California, SBS, has also been used by dairies in Tulare, Fresno, Merced, Stanislaus, San Joaquin, Kings, Kern, San Bernardino, Riverside, San Benito and Sacramento, to prevent cow lameness and nuisance flies.

When SBS is applied on manure, research indicates that most ammonia reductions occurred during the first day of SBS application and that ammonia emissions continued to decrease with increasing levels of SBS applications. However, after 24 hours, the reduction rates declined and by day three, the ammonia emissions reduction rates were no longer different between dosages. SBS is most effective in reducing ammonia emissions from dairy corrals at either an application rate of 50 pounds per 1,000 square feet, three times per week; or 75 pounds per 1,000 square feet, two times per week.

While SBS is considered an irritant because of its low pH, it is safe for use in water treatment. In particular, SBS has been used as a disinfectant to prevent damage of the membrane used in reverse osmosis during water treatment. SBS is certified for treating drinking water (e.g., for chlorine removal, corrosion and scale control, and pH adjustment). SBS is used to lower the pH of water for effective chlorination, including water in swimming pools. SBS is also approved as a general use feed additive, including companion animal food. Lastly, SBS is used as a urine acidifier to reduce urinary stones in cats.

SBS is considered Generally Recognized as Safe (GRAS) by the Food and Drug Administration (FDA) and meets their definition of a natural product (FDA, 1998). The FDA has approved of SBS as a food additive and food grade SBS bisulfate is used in a variety of food products, including beverages, dressings, sauces, cake mixes, and fillings. It is also widely used in meat and poultry processing and most recently in browning prevention of fresh cut produce.

Because SBS is a salt, the amount of SBS that is applied needs to be reviewed and controlled to prevent SBS contamination of water runoff that could result in water quality impacts and reduced pH levels. SBS use should be carefully considered in areas that are sensitive to salts and/or in areas with existing high salt loading in the soils. Because SBS loses its effectiveness over time, controlled and monitored application rates of SBS are needed to minimize the potential for water runoff and related water quality impacts.

PROJECT-SPECIFIC MITIGATION – SODIUM BISULFATE: Less than significant hydrology/water quality impacts were identified for the potential use of SBS as part of the 2012 AQMP so no mitigation measures are necessary or required.

REMAINING IMPACTS – SODIUM BISULFATE: The hydrology and water quality impacts associated with increased use of SBS are expected to be less than significant. Thus, no remaining hydrology or water quality impacts are expected from the projected increased use of this chemical.

4.5.4.6 Water Quality Impacts Associated with Increased Ammonia Storage

PROJECT-SPECIFIC IMPACTS – AMMONIA STORAGE: As discussed in Subchapter 4.4 – Hazards and Hazardous Materials, a spill of any hazardous materials including ammonia, could occur under upset conditions. Construction of the vessels and foundations in accordance with California Building Code requirements helps structures resist major earthquakes without collapse, but may result in some structural and non-structural damage following a major earthquake. As required by U.S. EPA's spill prevention control and countermeasure regulations, all affected facilities are currently required to have emergency spill containment equipment and would implement spill control measures in the event of an earthquake. Storage tanks typically have secondary containment such as a berm, which would be capable of containing 110 percent of the contents of the storage tanks. Therefore, should a rupture occur, the contents of the tank would be collected within the containment system and pumped to an appropriate storage tank.

Spills at affected industrial or commercial facilities would be collected within containment structures. Large spills outside of containment areas at affected facilities could occur when transferring the material from a transport truck to a storage tank; these spills are expected to be captured by the process water system where they could be collected and controlled. Spilled material would be collected and pumped to an appropriate tank or sent off-site if the materials cannot be used on-site.

PROJECT-SPECIFIC MITIGATION – AMMONIA STORAGE: Because of the state- and federally-mandated containment system design, spills are not expected to migrate from the facility in a way that would create significant adverse water quality impacts. Since less than significant hydrology/water quality impacts were identified for the potential storage of ammonia, no mitigation measures are necessary or required.

REMAINING IMPACTS – AMMONIA STORAGE: The hydrology and water quality impacts associated with ammonia storage are expected to be less than significant. Thus, no remaining hydrology or water quality impacts are expected from the projected increased storage of this chemical.

4.5.5 Summary of Hydrology and Water Quality Impacts

The following is the summary of the conclusions of the analysis of energy impacts associated with implementation of the 2012 AQMP.

- Wastewater treatment facilities are expected to have sufficient capacity to handle the estimated increase in wastewater that could be generated from reformulation of products and use of air pollution control equipment (e.g., wet ESPs and WGSs). Therefore, less than significant impacts associated with wastewater treatment or water quality is expected.
- The use of alternative fuels is not expected to result in greater adverse water quality impacts than the use of conventional fuels. Less than significant adverse hydrology and water quality impacts are expected from the increased use of alternative fuels.
- It is not expected that the recycling of EV and hybrid batteries would be greater than lead-acid batteries in conventional vehicles because although EV and hybrid batteries are typically larger than lead acid batteries, they typically have a much longer lifetime. As a result, potential illegal disposal and potential water quality impacts would be equivalent to, or possibly less for EV and hybrid batteries compared to lead-acid batteries. Therefore, less than significant adverse water quality impacts are expected from the increased use of EV and hybrid vehicles.
- Water demand associated with the manufacture and use of waterborne coatings, solvents, and other consumer products, and add-on air pollution control technologies such as wet ESPs and WGSs are potentially significant. While mitigation measures as available, they can vary from jurisdiction to jurisdiction, but it is expected that impacts would remain significant even after mitigation measures are implemented.
- The use and application of SBS should be controlled and monitored to prevent water quality runoff and related water quality impacts. Therefore, the use of SBS is expected to create less than significant water quality impacts.
- Potential spills associated with ammonia are expected to be contained on-site due to the requirement for secondary spill containment devices and berms. Therefore, potential ammonia spills that may affect water quality are expected to be less than significant.
- Summary of PM2.5 Control Measure Impacts: The hydrology and water quality impacts associated with PM2.5 Control Measures are potentially significant for water demand (BCM-03, IND-01, and MCS-01). The hydrology and water quality impacts associated with wastewater generation and related wastewater quality are less than significant. Further, the use and application of SBS (BCM-04) on water quality is also expected to be less than significant.

Summary of Ozone Control Measure Impacts: The hydrology and water quality impacts associated with Ozone Control Measures are potentially significant for water demand (CTS-01, CTS-02, CTS-03, CTS-04, and FUG-01). The water quality impacts associated with wastewater generation and related wastewater quality from 2012 AQMP Control Measures (CTS-01, CTS-02, CTS-03, CTS-04, and FUG-01) are less than significant. Less than significant adverse hydrology and water quality impacts are expected from the increased use of alternative fuels (IND-01, MSC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07). Similarly, less than significant adverse water quality impacts associated with increase battery use in EV and hybrid vehicles are expected (ONRD-01, ONRD-03, ONRD-04, ONRD-05, ADV-01, ADV-02, ADV-03, ADV-04, ADV-06, and ADV-07). Potential spills associated with ammonia are expected to be contained on-site due to the requirement for secondary spill containment devices and berms. Therefore, potential ammonia spills are expected to be less than significant.

SUBCHAPTER 4.6

LAND USE AND PLANNING

4.6 LAND USE AND PLANNING

4.6.1 Introduction

This subchapter examines impacts on the potential land use impacts associated with implementation of the proposed control measures in the 2012 AQMP.

4.6.2 2012 AQMP Control Measures with Potential Land Use Impacts

All control measures in the 2012 AQMP were evaluated to determine whether or not they could generate land use impacts based on the anticipated methods of control. Control measures that may result in land use impacts are included in Table 4.6-1. Some of the control measures could require construction activities which could generate land use impacts. Specifically, ONRD-05, ADV-01, and ADV-02 propose to advance zero-emission and cleaner combustion emission technologies for on-road heavy-duty vehicles and locomotives. Possible methods associated with these control measures could result in the construction of "wayside" electric or magnetic power built into roadway infrastructure to boost the pulling capacity or range of the heavy-duty vehicles. This may include battery charging or fueling infrastructure as well as transportation infrastructure such as overhead electrical catenary lines.

4.6.3 Significance Criteria

Implementation of the 2012 AQMP will be considered to have significant adverse land use impacts if any of the following conditions occur:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

- Physically divide an established community.

4.6.4 Potential Impacts and Mitigation

Potential land use impacts associated with the 2012 AQMP are associated primarily with the construction of support systems (e.g., catenary overhead electrical lines or magnetic infrastructure related to operation of zero- and near-zero transport systems). For purposes of evaluating potential land use impacts, it has been assumed herein that no new rail or truck traffic routes would be constructed, but rather that existing truck and rail routes/corridors would be modified. The truck and rail corridors likely to be involved with the 2012 AQMP modifications are located primarily in commercial and industrial zones within the Southern California area. Examples of these areas include, but are not limited to, the Port of Los Angeles (e.g., Navy Way) Port of Long Beach, and industrial areas in and around container transfer facilities (railway and truck routes) near the Terminal Island Freeway, along the Alameda Corridor, as well as inland railyards near downtown Los Angeles. Since only existing transportation routes would be modified (e.g., electric lines installed) and no new transportation routes are anticipated as part of the 2012 AQMP, no land use conflicts, or inconsistencies with any general plan, specific plan, local coastal program, or zoning ordinance are expected.

TABLE 4.6-1

Control Measures with Potential Land Use Impacts

CONTROL MEASURE	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	LAND USE IMPACT
OZONE CONTROL MEASURES			
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards (NOx, PM)	Incentives to replace older medium-duty vehicles with low-emitting vehicles.	Construction and operation of wayside power, catenary lines or other similar technologies could generate land use impacts and divide established communities.
ADV-01	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles (NOx)	Construct "wayside" electric or magnetic infrastructure, construction battery charging and fueling infrastructure.	Construction and operation of battery charging or fueling infrastructure, as well as transportation infrastructure, could generate land use impacts and divide established communities.
ADV-02	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives (NOx)	Construct "wayside" electric or magnetic infrastructure, construct battery charging or fueling infrastructure.	Construction and operation of wayside power, catenary lines or other similar technologies could generate land use impacts and divide established communities.

Construction activities would require the use of heavy equipment to install the electric or magnetic systems. Heavy construction equipment such as backhoes, cranes, aerial lifts, front end loaders, and other types of equipment would be required for installation. The electrical or magnetic systems would be installed within or adjacent to existing roadways. These construction activities are expected to occur along heavily travelled roadways (e.g., roads near the ports, such as Sepulveda Boulevard, Terminal Island Freeway, and Alameda Street). Construction activities may require barriers and closures to protect construction workers, prevent unintentional public entrance to the site, and avoid traffic conflicts.

Therefore, it is possible that construction activities could temporarily disrupt or divide a community. However, because construction of new traffic routes/corridors or widening of existing routes/corridors are not part of the proposed project, once construction activities are finished and the physical barriers removed, no long-term land use impacts are anticipated by the project. Therefore, from a land use perspective, none of the above construction impacts are considered to be significant.

The installation of electric and/or magnetic infrastructure is only expected to occur along existing roadways/freeways and transportation corridors (e.g., Sepulveda Boulevard, Terminal Island Freeway, and Alameda Street). These roads and freeways are already heavily traveled and in many cases already divide existing communities. For example, through portions of Carson and Los Angeles, the Alameda Corridor separates communities and there are a limited number of streets available to cross the Alameda Corridor in an east/west direction. The same is true with respect to Sepulveda Boulevard and the Terminal Island Freeways – both are heavy transportation corridors with limited opportunities to cross these roadways. Installation of electric and/or magnetic infrastructure will not change the existing condition (i.e., there will be limited opportunities to cross these major transportation corridors); however, the installation of the electric and/or magnetic infrastructure is not expected to create any new barriers or physically divide an established community.

Further, the electric and/or magnetic infrastructure would be expected to be construction within or adjacent to the existing rights-of-way of existing streets and freeways, so no conflict with existing land uses, general plans, specific plans, local coastal program, zoning ordinance, or other policies would be expected.

Any proposed modification to an existing rail or truck traffic route/corridor will require a separate CEQA evaluation. As discussed in Chapter 4.9 - Impacts Transportation and Traffic, Section 4.9.5, the traffic management plan should include identification of alternative routes of travel, which will identify a means of connecting established communities that have been temporarily divided by the construction activities associated with the project.

Project-specific Mitigation: No significant land use impacts were identified for the installation of catenary or overhead power lines associated with the 2012 AQMP so no mitigation measures are required.

Remaining Land Use Impacts: The land use impacts from proposed project are not expected to be significant; therefore, no mitigation measures are required.

4.6.5 Summary of Land Use Impacts

The following is the summary of the conclusions of the analysis of the land use impacts associated with implementation of the 2012 AQMP.

The 2012 AQMP control measures are not expected to conflict with applicable land use plans, policies, or regulations or physically divide an established community. Therefore, no significant adverse land use impacts are expected.

Summary of PM2.5 Control Measure Impacts: PM2.5 Control Measures were evaluated in the NOP/IS and it was determined that the PM2.5 Control Measures would not generate any potentially significant land use impacts.

Summary of Ozone Control Measure Impacts: Three Ozone Control Measures could result in the construction of overhead catenary lines; however, the potential land use impacts associated with the Ozone Control Measures were determined to be less than significant, as no land use conflicts were identified.

SUBCHAPTER 4.7

NOISE

4.7 NOISE

4.7.1 Introduction

This subchapter identifies 2012 AQMP control measures that could result in potential adverse noise impacts. Control measures that may have noise impacts are primarily those associated with construction activities.

4.7.2 2012 AQMP Control Measures with Potential Noise Impacts

All control measures in the 2012 AQMP were evaluated to determine whether or not they could generate noise impacts based on the anticipated methods of control. Control measures that may result in noise impacts are included in Table 4.7-1. Construction activities that could be required to implement the following control measures in the 2012 AQMP, BCM-03 - Emission Reductions from Under-Fired Charbroilers, CMB-01 - Further NOx Reductions from RECLAIM – *Phase I and Phase II*, CMB-02 - NOx Reductions from Biogas Flares, CMB-03 - Reductions from Commercial Space Heating, IND-01 - Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities, FUG-01 - ~~Further~~ VOC Reductions from Vacuum Trucks, FUG-02 - Emission Reduction from LPG Transfer and Dispensing – Phase II, FUG-03 - Further ~~VOC~~ Reductions from Fugitive VOC Emissions, MCS-01 - Application of All Feasible Measures Assessment, MCS-03 - Improved Start-up, Shutdown and Turnaround Procedures, INC-01 - Economic Incentive Programs to Adopt Zero and Near-Zero Technologies, OFFRD-04 - Further Emission Reductions from Ocean-Going Marine Vessels at Berth, ONRD-03 - Further Emission Reductions from Passenger Locomotives, ONRD-05 - Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards, ADV-01 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles, ADV-02 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives, ADV-03 - Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment, ADV-04 - Actions for the Deployment of Cleaner Commercial Harborcraft, ADV-05 - Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels, and ADV-06 - Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment. Some of the control measures could require construction activities which could generate noise impacts. Specifically, ONRD-03, ONRD-05, and ADV-01 propose to advance zero-emission and cleaner combustion emission technologies for on-road heavy-duty vehicles. Possible methods associated with this control measure could include cleaner engines using technologies such as electric, battery electric, and fuel cells, as well as alternative and renewable fuels. ONRD-03, ONRD-5 and ADV-01 could also result in the construction of "wayside" electric or magnetic power built into roadway infrastructure to boost the pulling capacity or range of the heavy-duty vehicles. This may include battery changing or fueling infrastructure as well as overhead electrical catenary lines. ADV-02 could require electrification of existing rail lines.

TABLE 4.7-1

Control Measures with Potential Secondary Noise Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	NOISE IMPACT
SHORT-TERM PM2.5 CONTROL MEASURES			
BCM-03 (*formerly BCM-05*)	Emission Reductions from Under-Fired Charbroilers	Add-On Control Equipment with Ventilation Hood Requirements (e.g., ESPs, HEPA filters, wet scrubbers, and thermal oxidizers).	Construction activities associated with air pollution control equipment could generate noise impacts.
IND-01[a]	Backstop Measure for Indirect Sources of Emissions from Ports and Port-Related Facilities	Environmental lease conditions, port rules, tariffs or incentives.	Control measure could result in construction activities associated with air pollution control equipment and other control strategies that could generate noise impacts.
MCS-01 [a]	Application of All Feasible Measures Assessment	SCAQMD ~~District~~ will adopt and implement new retrofit technology control standards as new BARCT standards become available.	Control measure could result in construction activities associated with air pollution control equipment and other control strategies that could generate noise impacts.
OZONE CONTROL MEASURES			
CMB-01	Further NOx Reductions from RECLAIM – *Phase I and Phase II*	Selective catalytic reduction, low NOx burners, NOx reducing catalysts, oxy-fuel furnaces, and selective non-catalytic reduction.	Implementation of BARCT technologies could result in construction activities that would generate noise impacts.
CMB-02	NOx Reductions from Biogas Flares (NOx)	Replacement of existing biogas flares with more efficient biogas flares	Replacement of flares could generate construction noise impacts.
CMB-03	Reductions from Commercial Space Heating (NOx)	This control measure seeks emission reductions from unregulated commercial fan-type central furnaces used for space heating.	Replacement of unregulated commercial fan-type central furnaces could generate noise impacts.
FUG-01	~~Further~~ VOC Reductions from Vacuum Trucks	VOC control devices such as carbon adsorption systems, internal combustion engines, thermal oxidizers, refrigerated condensers, liquid scrubbers and positive displacement (PD) pumps.	Construction activities associated with air pollution control equipment could generate noise impacts.
FUG-02	Emission Reduction from LPG Transfer and Dispensing – *Phase II*	Expand applicability of rule to LPG transfer and dispensing at facilities other than those that offer LPG for sale to end users included currently exempted facilities.	Construction activities associated with air pollution control equipment could generate noise impacts.

TABLE 4.7-1 (CONTINUED)

Control Measures with Potential Secondary Noise Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	NOISE IMPACT
OZONE CONTROL MEASURES			
MCS-03	Improved Start-up, Shutdown and Turnaround Procedures (All Pollutants)	Diverting or eliminating process streams that are vented to flares, and installing redundant equipment to increase operational reliability	Construction activities could generate noise impacts.
INC-01	Economic Incentive Programs to Adopt Zero and Near-Zero Technologies (NOx)	Installation of cleaner, more efficient combustion equipment, such as boilers, water heaters and commercial space heating or installation of control technologies including fuel cells, diesel particulate filters (DPF), NOx reduction catalysts, alternative electricity generation, such as wind and solar, battery electric, hybrid electric, and usage of low NOx and alternative fuels such as natural gas.	Replacement of existing combustion equipment and installation of emissions controls could generate noise impacts.
ONRD-03	Accelerated Penetration of Partial Zero Emission and Zero Emission Light-Heavy- and Medium-Heavy-Duty Vehicles [NOx, PM]	Construct "wayside" electric or magnetic infrastructure, construction battery charging and fueling infrastructure.	Construction activities associated with battery charging or fueling infrastructures, as well as transportation infrastructure, could generate noise impacts.
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards (NOx, PM)	Incentives to replace older medium-duty vehicles with low-emitting vehicles.	Construction activities associated with wayside power, catenary lines or other similar technologies could generate noise impacts.
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels at Berth	Shore power of vessels at berth, use of air pollution control technologies on exhaust gases from auxiliary engines and boilers (e.g., SCRs, DPM filters, electric batteries, and alternative fuels).	Construction activities associated with emission control technologies could generate noise impacts.
ADV-01	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles (NOx)	Construct "wayside" electric or magnetic infrastructure, construction battery charging and fueling infrastructure.	Construction activities associated with battery charging or fueling infrastructures, as well as transportation infrastructure, could generate noise impacts.

TABLE 4.7-1 (CONCLUDED)

Control Measures with Potential Secondary Noise Impacts

CONTROL MEASURE	CONTROL MEASURE TITLE (POLLUTANT)	CONTROL METHODOLOGY	NOISE IMPACT
OZONE CONTROL MEASURES			
ADV-02	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives (NOx)	Construct "wayside" electric or magnetic infrastructure, construct battery charging or fueling infrastructure.	Construction activities associated with wayside power, catenary lines or other similar technologies could generate noise impacts.
ADV-03	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment (NOx)	Construct electric gantry cranes, construct battery charging or fueling infrastructure, use of alternative fuels and fuel additives.	Construction activities associated with emission control technologies could generate noise impacts.
ADV-04	Actions for the Deployment of Cleaner Commercial Harborcraft (NOx)	Construct battery charging or fueling infrastructure, use of air pollution control equipment (e.g., SCR, use of alternative fuels and fuel additives).	Construction activities associated with emission control technologies could generate noise impacts.
ADV-05	Proposed Implementation Measures for the Deployment of Cleaner Ocean-Going Marine Vessels [NOx]	Construction of control technologies such as SCR and wet/dry scrubbers, use of alternative fuels.	Construction activities associated with emission control technologies could generate noise impacts.
ADV-06	Proposed Implementation Measures for the Deployment of Cleaner Off-Road Equipment [NOx]	Construct battery charging or fueling infrastructure, increased use of alternative fuels and fuel additives.	Construction activities associated with emission control technologies could generate noise impacts.

a. The specific actions associated with the control measure are unknown and, therefore, the impacts are speculative. In order to provide a conservative analysis, it is assumed that the control measure could require air pollution control technologies that are similar to those that are currently required (e.g., SCR, electrification, use of alternative fuels, etc.) and would have the potential to require construction activities that would generate noise.

4.7.3 Significance Criteria

Implementation of the 2012 AQMP would be considered to have significant adverse impact on noise or vibration if any of the following conditions occur:

- Construction noise levels exceed the local noise ordinances or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three decibels (dBA) at the site boundary. Construction noise levels will be considered significant if they exceed federal Occupational Safety and Health Administration (OSHA) noise standards for workers.

- The proposed project operational noise levels exceed any of the local noise ordinances at the site boundary or, if the noise threshold is currently exceeded, project noise sources increase ambient noise levels by more than three dBA at the site boundary.

- Construction and operation would have a significant vibration impact if ground vibration levels for residential structures would exceed 72 VdB for frequent events (70+ vibration events), 75 VdB for occasional events (30-70 events), and/or 80 VdB for infrequent events (e.g., 30 or fewer events) such as the acceptability limits prescribed by the Federal Transit Administration.

4.7.4 Potential Noise Impacts and Mitigation

Construction Activities: Potential noise impacts associated with the 2012 AQMP relate primarily to the construction activities associated with air pollution control equipment and construction of support systems (e.g., wayside power, catenary overhead electrical lines, battery charging or fueling infrastructures related to operation of zero- and near-zero transport systems). Control Measures ONRD-03, ONRD-05, and ADV-01 could require the installation of catenary overhead electrical lines within or adjacent to existing roadways, streets, freeways, and/or transportation corridors. ADV-02 could require the installation of electrical or magnetic infrastructure along rail lines. For purposes of evaluating potential noise impacts, it has been assumed herein that no new rail or truck traffic routes would be constructed, but rather some of these existing routes/corridors will be modified to include catenary overhead electrical lines or magnetic lines. A number of control measures could result in the construction of air pollution control equipment including BCM-03, IND-01, MCS-01, CMB-01, FUG-01, FUG-02, INC-01, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06.

The existing rail and truck routes/corridors likely to be modified are located primarily in commercial and industrial zones within the Southern California area. Examples of these areas include, but are not limited to, the Port of Los Angeles, Port of Long Beach, and industrial areas in and around container transfer facilities (rail and truck) near the Terminal Island Freeway, along the Alameda Corridor, as well inland railyards near downtown Los Angeles. Construction activities may also occur at stationary sources where air pollution control equipment or new equipment may be installed.

Construction activities may require the use of heavy construction equipment. As specific construction projects are not currently proposed, the specific types of construction equipment necessary to implement the proposed control measures are not currently known. The noise levels from typical construction equipment are presented in Table 4.7-2.

The construction equipment noise sources identified in Table 4.7-2 represent typical construction equipment that range from 72 dBA to over 100 ~~decibels (~~dBA~~)~~ for activities such as pile driving. The construction equipment, hours of operations, number of pieces of equipment operating at the same time, and construction phases, would vary depending on the specific project; therefore, the construction noise levels are also expected to vary. Each construction phase would use a combination of equipment and personnel that would vary throughout that phase. In addition, construction phases could overlap at the site. This would lead to a variety of possible construction activities and equipment that may occur at any given time throughout the construction process.

Construction activities would generate noise from heavy construction equipment and construction-related traffic. A typical construction site would be expected to generate noise levels of about 85 dBA~~ecibels~~ at 50 feet from the center of construction activity. Most of the construction noise sources would be located at or near ground level, which would help attenuate noise levels. The estimated noise from a representative construction site at increasing distances from the site is provided in Table 4.7-3.

TABLE 4.7-2

Noise Level Ranges of Typical Construction Equipment

EQUIPMENT	TYPICAL RANGE IN ~~(~~DECIBELS (dBA) [a]
Truck	82-95
Front Loader	73-86
Backhoe	73-95
Vibrator	68-82
Saws	72-82
Pneumatic Impact Equipment	83-88
Jackhammers	81-98
Pumps	68-72
Generators	71-83
Compressors	75-87
Concrete Mixers	75-88
Concrete Pumps	81-85
Pile Driving (peaks)	95-107
Tractor	77-98
Scrapers, Graders	80-93
Pavers	85-88
Cranes	75-89

[a] City of Los Angeles, 2006. Levels are in dBA at 50-foot reference distance.

TABLE 4.7-3

Noise Level Attenuation at a Representative Construction Site

DISTANCE FROM CONSTRUCTION NOISE SOURCE	ESTIMATED NOISE LEVEL (dBA)
50	85
100	79
200	73
400	67
800	61
1,600	55
3,200	49
6,400	43

Assuming construction activities of about 85 dBA at 50 feet from the center of construction activity and using an estimated six dBA reduction for every doubling of distance, the noise levels are expected to decrease about 61 dBA at about 800 feet from construction activities.

The potential noise impact of construction activities would vary depending on the existing noise levels in the environment and the location of sensitive receptors (e.g., residents, hotels, hospitals, etc.) from proposed construction activities. Because no specific projects are currently proposed, the noise impacts are speculative. Nonetheless, construction activities associated with control measures in the 2012 AQMP could occur throughout the Basin. The 2012 AQMP may require existing commercial or industrial owners/operators of affected facilities to install air pollution control equipment of modify their existing operations to reduce stationary source emissions. Potential modifications would occur at facilities typically located in appropriately zoned industrial or commercial areas. Installing air pollution control equipment could generate noise impacts, but virtually all of the control equipment would be installed within industrial and commercial facilities, so that construction noise impacts at stationary sources on sensitive receptors are expected to be less than significant.

The 2012 AQMP may also require construction of overhead catenary lines or other similar technologies along existing roadways and transportation corridors. Noise levels from the existing roadways and transportation corridors that could be impacted by these control measures (e.g., ONRD-03, ONRD-05, ADV-01 and ADV-02) are expected to be high as they are heavily traveled transportation corridors (e.g., Terminal Island Freeway and Alameda Street). The construction of catenary lines or similar technologies would result in additional noise sources (e.g., heavy construction equipment) near these transportation corridors. There are residential areas and other sensitive receptors near some of these transportation corridors that include: 1) the western portions of the City of Long Beach near and adjacent to the Terminal Island Freeway and near Sepulveda Boulevard; 2) residents in the City of Wilmington near Alameda Street; and, 3) residents in the City of Carson and other cities and jurisdictions along Alameda Street. Some of these residents are located within several hundred feet of the existing roadways so noise levels associated with construction activities could be in the range of 65-75 dBA, which could result in noise increases of three dBA or greater and generate significant impacts.

Vibration associated with ground-borne sources is generally not a common environmental problem. However, construction activities such as blasting, pile driving, and heavy earth-moving equipment are potential sources of vibration during construction activities. As described for construction noise impacts, some residents are located with several hundred feet of the existing roadways and construction activities could result in noticeable vibration impacts.

Project construction would involve equipment and activities that may have the potential to generate goundborne vibration. In general, demolition of structures during construction generates the highest levels of vibration. The FTA has published standard vibration levels and peak particle velocities for construction equipment operations (FTA, 2006). The approximate velocity level and peak particle velocities for large construction equipment are listed in Table 4.7-4. Ground-borne vibration is quantified in terms of decibels, since that scale compresses the range of numbers required to describe the oscillations. The FTA uses vibration decibels (abbreviated as VdB) to measure and assess vibration amplitude. In the United States, vibration is referenced to one micro-inch/sec (25.4 micro-mm/sec) and presented in units of VdB.

The FTA recommends using an estimated six VdB reduction for every doubling of distance (FTA, 2006). Using the FTA methodology, the VdB would range from 40 to 82 VdB within 200 feet from construction activities, depending on the type of equipment used. The predicted vibration during construction activities can be compared to the significance threshold of 72 VdB. Vibration from construction activities could exceed the 72 VdB threshold for structures and sensitive receptors within 200 feet of construction activities, if certain types of construction equipment are used. Therefore, vibration impacts associated with construction activities are potentially significant.

TABLE 4.7-4

Representative Construction Equipment Vibration Impacts

EQUIPMENT	APPROXIMATE PEAK PARTICLE VELOCITY AT 25 FT. (INCHES/SECOND)[a]	APPROXIMATE VELOCITY LEVEL AT 25 FT. (VDB)[a]	APPROXIMATE VELOCITY LEVEL AT 200 FT. (VDB)[a]
Pile Driver typical	0.644	100	82
Vibratory Roller	0.210	94	76
Large Bulldozers	0.089	87	69
Loaded Trucks	0.076	86	68
Jackhammer	0.035	79	61
Small Bulldozer	0.003	58	40

a. Source: FTA, 2006. Data reflects typical vibration level.

Construction activities are often limited to daytime hours to prevent noise impacts during the more sensitive nighttime hours. However, transportation-related construction activities often occur during the evening/nighttime hours to minimize traffic impacts during the more heavy traffic periods. For example, construction activities related to catenary overhead lines may occur during the evening/nighttime hours to minimize traffic conflicts, as construction would be expected along existing roads and transportation corridors. Therefore, there is the potential for significant noise and vibration impacts during construction activities.

Workers exposed to noise sources in excess of 90 dBA for an eight-hour period would be required to wear hearing protection devices that conform to Occupational Safety and Health Administration/National Institute for Occupational Safety and Health (NIOSH) standards.

Operational Activities: As discussed above, the 2012 AQMP may require existing commercial or industrial owners/operators of affected facilities to install air pollution control equipment of modify their existing operations to reduce stationary source emissions. Potential modifications would occur at facilities typically located in appropriately zoned industrial or commercial areas. Installing air pollution control equipment on stationary sources could generate noise and vibration impacts, but virtually all of the control equipment would be installed within industrial and commercial facilities. Further, noise requirements and noise ordinances would continue to apply to stationary sources, so that noise impacts on sensitive receptors are expected to be less than significant.

Wayside electrification/magnetizing could be installed as a result of implementing Control Measures ONRD-03, ONRD-05, ADV-01 and ADV-02. Installation of catenary lines/rail electrification would likely occur along existing transportation corridors and railways and is not expected to require constructing new roadways or corridors. It is not expected that trucks and locomotives using wayside sources of electricity electric would be louder than non-electrified mobile sources. Indeed, electric motors connected to wayside power would likely be quieter than diesel mobile sources because electric motors have fewer moving parts. Further, wayside power would likely be installed on major transportation corridors where noise levels are already high and, often, are the major noise sources in many areas, especially industrial areas and near the ports. Therefore, operational noise and vibration impacts associated with the 2012 AQMP are expected to be less than significant.

Noise Impacts Mitigation: The impact of the proposed project on local noise levels during construction, although temporary in nature, could be significant. In order to mitigate potential noise impacts during construction activities, project-specific information would be necessary in order to first identify the specific impacts (e.g., project location, distance of roadway to be altered, etc.) to develop appropriate mitigation measures.

Ultimately, mitigation measures for construction would need be identified on a project-by-project basis and would be the responsibility of the lead agencies based on their underlying legal authority to mitigate project impacts. For example, in the Draft Program EIR prepared for SCAG's 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy, mitigation measure TR29 (MM-TR29) identifies noise mitigation measures during construction as follows:

NO-1: To reduce noise impacts due to construction, project sponsors may require construction contractors to implement a site-specific noise reduction program, subject to the Lead Agency (or other appropriate government agency) review and approval, which includes the following measures:

- Equipment and trucks used for project construction may utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically-attenuating shields or shrouds, wherever feasible).
- Except as may be exempted by the Lead Agency (or other appropriate government agency), impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction may be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust may be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves may be used, if such jackets are commercially available and this could achieve a reduction of five dBA. Quieter procedures may be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.

- Stationary noise sources may be located as far from adjacent sensitive receptors as possible and they may be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the Lead Agency (or other appropriate government agency) to provide equivalent noise reduction.

NO-2: Prior to the issuance of a building permit, along with the submission of construction documents, each project sponsor may submit to the Lead Agency (or other government agency as appropriate) a list of measures to respond to and track complaints pertaining to construction noise. These measures may include:

- A procedure and phone numbers for notifying the Lead Agency staff and local Police Department (during regular construction hours and off-hours);
- A sign posted on-site pertaining with permitted construction days and hours and complaint procedures and who to notify in the event of a problem. The sign may also include a listing of both the Lead Agency and construction contractor's telephone numbers (during regular construction hours and off hours);
- The designation of an on-site construction complaint and enforcement manager for the project;
- Notification of neighbors and occupants within 300 feet of the project construction area at least 30 days in advance of extreme noise generating activities about the estimated duration of the activity; and
- A preconstruction meeting may be held with the job inspectors and the general contractor/on-site project manager to confirm that noise measures and practices (including construction hours, neighborhood notification, posted signs, etc.) are completed.

NO-3: Project sponsor may implement use of portable barriers in the vicinity of sensitive receptors during construction including construction of subsurface barriers, debris basins, and storm water drainage facilities.

NO-4: For projects that require pile driving or other construction noise above 90 dBA in proximity to sensitive receptors, to further reduce potential pier drilling, pile driving and/or other extreme noise generating construction impacts greater than 90dBA, a set of site-specific noise attenuation measures may be completed under the supervision of a qualified acoustical consultant. Prior to commencing construction, a plan for such measures may be submitted for review and approval by the Lead Agency (or other appropriate government agency) to ensure that maximum feasible noise attenuation would be achieved. This plan may be based on the final design of the project. A third-party peer review, paid for by the project sponsor, may be required to assist the Lead Agency in evaluating the feasibility and effectiveness of the noise reduction plan submitted by the project sponsor. The criterion for approving the plan may be a determination that maximum feasible noise attenuation would be achieved. The noise reduction plan may include, but not be limited to, an evaluation of implementing the following measures. These attenuation measures may include as many of the following control strategies as applicable to the site and construction activity:

- Erect temporary plywood noise barriers around the construction site, particularly along on sites adjacent to residential buildings;
- Implement "quiet" pile driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile driving duration), where feasible, in consideration of geotechnical and structural requirements and conditions;
- Utilize noise control blankets on the building structure as the structures are erected to reduce noise emission from the site;
- Evaluate the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings by the use of sound blankets for example and implement such measure if such measures are feasible and would noticeably reduce noise impacts; and
- Monitor the effectiveness of noise attenuation measures by taking noise measurements.

NO-5: Noise generated from any rock-crushing or screening operations performed within 3,000 feet of any occupied residence may be mitigated by the project sponsor by strategic placement of material stockpiles between the operation and the affected dwelling or by other means approved by the local jurisdiction.

NO-6: Where feasible, pile holes may be pre-drilled to reduce potential noise and vibration impacts.

NO-7: As necessary, each project sponsor may retain a structural engineer or other appropriate professional to determine threshold levels of vibration and cracking that could damage any adjacent historic or other structure subject to damage, and design means and construction methods to not exceed the thresholds.

NO-8: Project sponsors may comply with all local sound control and noise level rules, regulations, and ordinances.

NO-9: As part of the appropriate environmental review of each project, a project specific noise evaluation may be conducted and appropriate mitigation identified and implemented.

Remaining Noise Impacts: The noise impacts from the proposed project are expected to be significant prior to mitigation. While generally mitigation measures could help minimize some of the noise impacts, SCAQMD cannot predict how a future lead agency might choose to mitigate a particular significant noise impact. Thus, the potential exists for future noise impacts to be significant even after feasible mitigation measures are identified and imposed. Therefore, noise impacts that may occur as a result of implementing the 2012 AQMP are expected to remain significant.

4.7.5 Summary of Noise Impacts

The following is the summary of the noise and vibration impacts associated with implementation of the 2012 AQMP.

- Noise and vibration impacts would be temporary in nature and related solely to construction activities, but could be significant.
- No modification to existing rail or truck traffic routes/corridor is expected; therefore, noise and vibration impacts associated with operational activities are expected to be less than significant.

Summary of PM2.5 Control Measure Impacts: PM2.5 Control Measures were evaluated and it was determined that noise and vibration impacts would be limited to construction activities associated with air pollution control activities. Construction noise/vibration impacts associated with these activities are expected to be less than significant as they will occur within appropriately zoned industrial and commercial areas, impacts are temporary and limited to construction activities, and construction noise/vibration impacts to sensitive receptors would not be expected.

Summary of Ozone Control Measure Impacts: Three Ozone Control Measures could result in the construction of overhead catenary lines. The potential noise/vibration impacts of the Ozone Control Measures during the construction phases were determined to be significant, mitigation measures were imposed, however, construction noise/vibration impacts could remain significant in areas where sensitive receptors are located near transportation corridors.

SUBCHAPTER 4.8

SOLID AND HAZARDOUS WASTE

4.8 SOLID AND HAZARDOUS WASTE

4.8.1 Introduction

This subchapter identifies potential solid and hazardous waste impacts that may be generated by implementing the 2012 AQMP. The potential impacts to the generation of solid and hazardous waste associated with the implementation of the 2012 AQMP are described below.

The analysis of solid and hazardous waste impacts assumes that safety and disposal procedures required by various agencies in the state of California will provide reasonable precautions against the improper disposal of hazardous wastes in a municipal waste landfill. Because of state and federal requirements, some facilities are attempting to reduce or minimize the generation of solid and hazardous waste by incorporating source reduction technologies to reduce the volume or toxicity of waste generated, including improving operating procedures, using less hazardous or non-hazardous substitute materials, and upgrading or replacing inefficient processes.

4.8.2 2012 AQMP Control Measures with Solid and Hazardous Waste Impacts

Implementing some of the 2012 AQMP control measures could increase the generation and disposal of solid and hazardous waste in the region. Specifically, some control measures will encourage the use of electric vehicles which could result in an increase in waste associated with spent batteries. Other control measures could increase the generation of solid or hazardous waste due to installation of air pollution control equipment, such as activated carbon, filters, and catalysts. Finally, other control measures would encourage the early retirement of older equipment and replacement with newer and lower emission technology equipment which would generate additional waste. Table 4.8-1 lists the 2012 AQMP control measures with potential adverse solid and hazardous waste impacts through the addition of materials requiring disposal.

Evaluation of control methods for each control measure indicated that there are 23 control measures that could have potential solid and hazardous waste impacts. As shown in Table 4.8-1, three PM2.5 control measures and 20 ozone control measures could have significant impacts on solid and hazardous wastes.

TABLE 4.8-1

Control Measures with Potential Solid and Hazardous Waste Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	POTENTIAL SOLID AND HAZARDOUS WASTE IMPACT
Short-Term PM2.5 Control Measures			
CMB-01	Further NOx Reductions from RECLAIM [NOx] –Phase I & II	Installation of SCR systems and burner replacement.	Potential increase in solid waste due to burner replacement & SCR catalyst disposal.
BCM-03 (*formerly BCM-05*)	Emission Reductions from Under-Fired Charbroilers [PM2.5]	Control options include ESPs, HEPA filters, wet scrubbers, and thermal oxidizers.	Potential increase in solid waste associated with air pollution control equipment (e.g., filters).
IND-01[a]	Backstop Measure for Indirect Sources of emissions from Ports and Port-Related Facilities	Potential control measures include electrification of sources, early retirement of equipment, air pollution control equipment on sources, use of alternative fuels.	Potential increase in solid waste due to early retirement of equipment, solid was associated with air pollution control equipment, EV battery disposal.
MCS-01[a]	Application of All Feasible Measures Assessment	Implement new retrofit technology control standards as new BARCT standards become available.	Potential increase in solid waste associated with air pollution control equipment (e.g., filters, early retirement of equipment).
Ozone Control Measures			
CMB-02	NOx Reductions from Biogas Flares	Construction of replacement flares.	Potential increase in solid waste from replacing old flares with new flares.
CMB-03	Reductions from Commercial Space Heating	Burner replacement.	Potential increase in solid waste due to burner replacement.
INC-01	Economic Incentive Programs to Adopt Cleaner, More Efficient Combustion Equipment [All Pollutants]	Control technologies for funding include fuel cells, diesel particulate filters (DPF), NOx reduction catalysts, alternative electricity generation, such as wind and solar, battery electric, hybrid electric, and usage of low NOx and alternative fuels such as natural gas.	Potential increase in solid waste due to combustion equipment replacement, generation of solid waste from air pollution control equipment (e.g. used filters), and EV battery disposal.
ONRD-01	Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles [VOC, NOx, PM]	Implement rebate incentive program to purchase low-emitting vehicles.	Potential increases in solid waste from EV battery disposal and early retirement of vehicles.
ONRD-02	Accelerated Retirement of Older Light- and Medium-Duty Vehicles [VOC, NOx, PM]	Continue Enhanced Fleet Modernization Program (EFMP) through 2023.	Potential increase in solid waste generation from early retirement of vehicles and EV battery disposal.
ONRD-03	Accelerated Penetration of Partial Zero Emission and Zero Emission Light-Heavy- and Medium-Heavy-Duty Vehicles [NOx, PM]	Would continue the state hybrid truck and bus voucher incentive project (HVIP) through 2023. Use of electric and alternative fuel vehicles.	Potential increase in solid waste generation from early retirement of vehicles and EV battery disposal.

TABLE 4.8-1 (CONTINUED)

Control Measures with Potential Solid and Hazardous Waste Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	POTENTIAL SOLID AND HAZARDOUS WASTE IMPACT
Ozone Control Measures			
ONRD-04	Accelerated Retirement of Older On-Road Heavy-Duty Vehicles [NOx, PM]	Incentives to purchase low-emitting vehicles.	Potential increase in solid waste generation from early retirement of vehicles and EV battery disposal.
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Serving Near-Dock Railyards [NOx, PM]	Accelerated use of hybrid electric or fuel cell trucks.	Potential increase in solid waste generation from early retirement of vehicles and EV battery disposal.
OFFRD-01	Extension of the SOON Provision for Construction/Industrial Equipment [NOx]	Extend SOON program from 2014 to 2023. Use of electric and alternative fuel construction/industrial equipment.	Potential increase in solid waste generation from early retirement of equipment and EV battery disposal.
OFFRD-02	Further Emission Reductions from Freight Locomotives [NOx, PM]	Replace existing engines with Tier 4 engines with control equipment (e.g., SCRs).	Potential increase in solid waste generation from early retirement of locomotive engines, solid waste generated from air pollution control equipment, and EV battery disposal.
OFFRD-03	Further Emission Reductions from Passenger Locomotives [NOx, PM]	Repower existing engines with Tier 4 engines with control equipment (e.g., SCRs).	Potential increase in solid waste generation from early retirement of locomotive engines, solid waste generated from air pollution control equipment (e.g., DPM filters and catalyst), and EV battery disposal.
OFFRD-04	Further Emission Reductions from Ocean-Going Marine Vessels While at Berth [NOx, PM]	Calls for increased percentage of ships at berth to cold iron.	Potential increase in solid waste generation from air pollution control equipment (e.g., catalysts) from ships at berth.
ADV-01	Actions for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles [NOx]	Use of electric and alternative fuel vehicles.	Potential increase in solid waste generation from early retirement of vehicles and EV battery disposal.
ADV-02	Actions for the Deployment of Zero- and Near-Zero Emission Locomotives [NOx]	Use of electric and alternative fuel locomotives.	Potential increase in solid waste due to locomotive replacement and from EV battery disposal.
ADV-03	Actions for the Deployment of Zero- and Near-Zero Emission Cargo Handling Equipment [NOx]	Use of electric and alternative fuel cargo handling equipment.	Potential increase in solid waste due to CHE replacement and from EV battery disposal.
ADV-04	Actions for the Deployment of Cleaner Commercial Harbor Craft [NOx]	Use of electric and alternative fuel harbor craft and use of control equipment such as SCRs.	Potential increase in solid waste due to harbor craft replacement, EV battery disposal, and disposal of SCR catalyst.

TABLE 4.8-1 (CONCLUDED)

Control Measures with Potential Solid and Hazardous Waste Impacts

CONTROL MEASURES	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	POTENTIAL SOLID AND HAZARDOUS WASTE IMPACT
Ozone Control Measures			
ADV-05	Actions for the Deployment of Cleaner Ocean-Going Marine Vessels [NOx]	Use of electric and alternative fuel marine vessels. Use of control technologies such as SCR, wet/dry scrubbers, etc.	Potential increase in solid waste due to vessel replacement, EV battery disposal, and scrubber/catalyst disposal.
ADV-06	Actions for the Deployment of Cleaner Off-Road Equipment [NOx]	Use of electric and alternative fuel off-road equipment.	Potential increase in solid waste due to off-road equipment replacement and from EV battery disposal.
ADV-07	Actions for the Deployment of Cleaner Aircraft Engines [NOx]	Potential low emission aircraft technologies include alternative fuels, lean combustion burners, high rate turbo bypass, advanced turbo-compressor design, and engine weight reduction.	Potential increase in solid waste due to replacement of aircraft engines and burners.

a The specific actions associated with the control measure is unknown and, therefore, the impacts are speculative. In order to provide a conservative analysis, it is assumed that the control measure could require air pollution control technologies that are similar to those that are currently required (e.g., SCR, electrification, use of alternative fuels, etc.), and would have the potential to require construction activities that would generate noise.

4.8.3 Significance Criteria

Impacts to solid and hazardous waste facilities will be considered significant if any of the following occur:

- Published national, state, or local standards relating to solid waste are exceeded.
- The generation and disposal of solid or hazardous waste, when combined with existing waste generation, exceeds the capacity of designated landfills.

4.8.4 Potential Impacts and Mitigation

The goal of the 2012 AQMP is to improve air quality, however, some types of air pollution control equipment have the potential to create cross-media impacts. For example, removing pollutants from equipment exhaust streams may produce liquid or solid wastes that may require further treatment or disposal to publicly owned treatment works (POTWs) or landfills, respectively. Specifically, hazardous and non-hazardous waste maybe generated by some types of air pollution control equipment such as electrostatic precipitators, carbon adsorption units, oxidation devices, wet scrubbers, baghouses, and filtration equipment. Several control measures have been proposed in the 2012 AQMP which may require the use of these types of pollution control equipment (see Table 4.8-1). Solid waste impacts from these control measures are described in the following subsections.

4.8.4.1 Spent Batteries from Electric Vehicles

PROJECT-SPECIFIC IMPACTS: The following control measures encourage early retirement of older vehicles and replacement with electric or hybrid vehicles and could result in an increase in waste generated from batteries: IND-01, INC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, and ADV-06. The most common battery currently used in gasoline and diesel powered vehicles within the district is the lead-acid battery found in conventional automobiles and trucks. These batteries are disposed of through the well established lead recycling industry by companies such as Quemetco and Exide in southern California. Zero and Near-Zero Emission Vehicles operate with different battery types than the lead-acid battery. The common battery types available for hybrid and electric powered vehicles are nickel metal hydride (NiMH) and lithium ion (Li-ion).

The 2012 AQMP projects substantial penetration of fuel cell, electric and electric hybrid vehicles by 2023 as part of mobile source pollution control measures. The suggested control measures that have additional requirements for Zero and Near-Zero Emission Vehicles are shown in Table 4.8.2. The batteries that could power these vehicles have useful lives similar to or less than the life of a vehicle. Since some batteries contain toxic materials, the increased use of batteries may result in an incremental increase in solid and hazardous waste impacts. In addition, environmental impacts could occur if batteries were disposed of in an unsafe manner, such as illegal dumping or by disposal in an unlined landfill.

TABLE 4.8-2

Control Measures and Vehicle Retirement Quantities

CONTROL MEASURE	NUMBER OF VEHICLES
ONRD-01 – Incentivize light- and medium-duty trucks	9,000 vehicles
ONRD-02 – Accelerated retirement and replacement of pre-1992 light- and medium-duty vehicles	18,000 vehicles
ONRD-03 – Encourage the introduction of hybrid and zero-emission vehicles	5,000 vehicles
ONRD-04 – Accelerated retirement and replacement of pre-2010 heavy duty vehicles	5,000 vehicles
ONRD-05 – Replace 1,000 trucks with zero-emission vehicles	1,000 vehicles

Source: CEC, 2012a

The primary battery used in hybrid cars is the NiMH type. NiMH batteries are considered to be less toxic than lead-acid batteries. Another type is Li-ion batteries which are being developed for the next generation of hybrid cars, and may ultimately be the battery to power all electric vehicles. The reason for this is that the Li-ion battery has a higher energy density, allowing them to hold the most energy by weight or by volume. Additionally, the Li-ion battery is less toxic than both the lead-acid and NiMH batteries.

Planning is already underway to deal with tens of thousands of exhausted NiMH batteries from conventional hybrids and Li-ion batteries from electric cars. While there are more than two million conventional and plug-in hybrids and electric cars on the road in the U.S. alone, none have been around long enough to start contributing a meaningful flow of batteries to the recycling industry. Most hybrid batteries seem to be able to outlive the ten-year/100,000-mile warranties that they carried from the automakers, and many battery and automotive industry insiders say there appears to be no reason that Li-ion batteries will not last for 150,000 miles or more (Edmunds, 2012).

Recycling is an important aspect of battery life. The Li-ion batteries used in most EVs and plug-in hybrids, and the NiMH batteries used in most conventional hybrids, are not considered toxic. Both types, unlike conventional 12-volt lead-acid car batteries, are considered safe for landfills. But, since landfill space is at a premium, it is more beneficial for the environment and the economy if spent advanced-technology batteries are reduced to their components, which can be reused instead of being sent to landfills. Automakers, and the auto dismantling industry and its designated recyclers, are posed to handle the recycling of NiMH and Li-ion batteries (Edmunds, 2012).

Recycling is expected to help keep battery costs down because it will permit the reuse of the metals and rare-earth compounds that make these batteries work, which is cheaper than mining and processing all-new material. With Li-ion batteries accounting for as much as half the cost of a new EV, reducing battery costs through recycling will go a long way toward making electric-drive vehicles competitive with conventional cars. Having a market for used batteries will also help increase the resale value of electric-drive vehicles to the benefit of consumers. Additionally, advanced battery recycling helps reduce CO_2 emissions and energy use from processing new material (Edmunds, 2012).

The NiMH batteries found in hybrid vehicles are basically "zero-landfill" products. Whatever cannot be recycled is consumed in the recycling process, leaving no trash behind. The primary metals recovered are nickel, copper and iron. The principal rare earths are neodymium and lanthanum (Edmunds, 2012).

Li-ion batteries now are somewhere between 70 and 100 percent recyclable, depending on the particular chemistry of the batteries. There are approximately six different types in use, and more are being developed. The types are differentiated by the chemical formulation of the electrodes. These types include, but are not limited to, cobalt dioxide, nickel-cobalt-manganese (NCM), nickel-cobalt- aluminum (NCA), manganese oxide spinel (MnO), and iron phosphate (FePo). The components of Li-ion batteries that cannot be recycled are mostly consumed as fuel in the furnaces that are used to melt down the metals, which include cobalt, copper, iron, nickel, manganese and, in the future, lithium (Edmunds, 2012).

Li-ion batteries have a potential after-automotive use that can postpone destructive recycling for years. Even when an EV or hybrid battery can no longer hold and discharge sufficient electricity to power the car's motor, the pack can still carry a tremendous amount of energy. Battery manufacturers project the packs will still be able to operate at approximately 80 percent of capacity when they must be retired from automotive use. Auto companies are partnering with battery, recycling and electronics firms to figure out and develop post-automotive markets for lithium-ion battery packs (Edmunds, 2012).

For instance, several major power utilities are working with companies, including General Motors, Ford, Toyota and Nissan, to explore the use of the batteries for stationary storage of the power produced in off-peak periods by wind turbines and solar generation stations. Li-ion packs also are being tested as backup power storage systems for retail centers, restaurants and hospitals, as well as for residential solar power systems (Edmunds, 2012).

Two recycling firms have the technology to recycle NiMH and Li-ion batteries. One of these companies is the Belgium-based metals recycling company Umicore, who is preparing for the time when advanced-technology automotive battery recycling companies will be handling battery packs from hundreds of thousands of hybrids and EVs each year. Umicore is the European leader and is expanding in the U.S. The other company, Kinsbursky Brothers, handles most North American advanced automotive battery recycling through a joint venture with longtime battery recycling company Toxco. The Kinsbursky Brothers' Toxco operation appears to be the recycler most widely used by companies that sell hybrids and EVs in North America. The company also receives batteries from carmakers in Europe. (Edmunds, 2012).

Each operation uses a proprietary system and both now are concerned mainly with recycling NiMH batteries. Both companies also are handling small volumes of Li-ion packs as they work with automakers to develop the best recycling processes. Because of the sales pace for EVs and hybrid cars and trucks, it is expected that a commercially viable recycling market would take at least a decade to develop (Edmunds, 2012).

Both companies process batteries from automakers and dismantlers. Battery packs typically have a recycling-information sticker on them so wrecking yards, garages, and car dealers can get instructions for directing "end-of-life" batteries to the proper recycling operation. Toyota offers a $200-per-pack bounty to encourage dealers and others to turn in spent packs rather than discarding them. Once the packs are at the proper distribution point, the recyclers break down their constituent parts to salvage any wiring, electrical components and plastics that can be separately recycled (Edmunds, 2012).

Currently, Umicore does the initial component separation in Germany and soon will be conducting the process at a North American facility being built in Maxton, North Carolina. The battery cells will continue to be shipped to Umicore's industrial-scale pilot recycling plant in Hoboken, Belgium. The Hoboken facility put the cells through a process that separates their content into metal alloys and a slag that, when NiMH batteries are being recycled, concentrates the rare earth elements they contain. The recycler sells the metals to battery makers for reuse. The rare-earth concentrate from NiMH batteries is sold for reprocessing. Umicore sells the slag from Li-ion batteries to cement makers, who use it as an aggregate that helps strengthen concrete (Edmunds, 2012).

At Toxco, the process also starts by gathering batteries at a variety of collection points from automakers and wrecking yards. The company sends the batteries to facilities in Trail, British Columbia, and Lancaster, Ohio, where they are flash-frozen to ensure that the lithium does not cause a fire when the cells are broken into. Then metal shredders tear them apart. Toxco is increasing capacity at its Ohio facility under a federal grant it received in 2009. The additional space and new equipment will help the company improve the cost-effectiveness of lithium battery recycling (Edmunds, 2012).

Most battery and fuel cell technologies currently employ materials that have high economic value and, therefore, are recyclable. Additionally, both regulatory requirements and market forces require and encourage recycling. The following is a brief listing of some of the more important Federal and California regulations that have created requirements and incentives for the proper disposal and recycling of EV battery packs:

- The federal Battery Act promulgated in 1996 requires that each regulated battery be labeled with a recycling symbol. NiCad batteries must be labeled with the words "NiCad" and the phrase "Battery must be recycled or disposed of properly." Lead-acid batteries must be labeled with the words "Lead," "Return," and "Recycle."

- Current California and federal regulations require ZEV manufacturers to take into account the complete life-cycle of car batteries and to plan for safe disposal and/or recycling of battery materials.

- The California Health and Safety Code does not allow the disposal of lead-acid batteries at a solid waste facility or on or in any land, surface waters, water courses, or marine waters. Legal disposal methods for used lead-acid batteries are to recycle/reuse the battery or to dispose of it at a hazardous waste disposal facility. A lead-acid battery dealer is required to accept spent batteries when a new one is purchased.

- California Public Resources Code requires state agencies to purchase car batteries made from recycled material.

- The Universal Waste Rule requires that spent batteries exhibiting hazardous waste characteristics and that are not recycled need to be managed as hazardous waste. This includes lead-acid and NiCad batteries.

- Car manufacturers offer incentives to recycle batteries (e.g., Toyota offers $200 for spent battery packs to help promote battery recycling).

Recycling of lead-acid and nickel-cadmium batteries is a well-established activity. Eighty percent of lead consumed in the United States is used to produce lead-acid batteries and the lead recovery rate from batteries is approximately 80 to 90 percent. The remainder is plastic and fluids (e.g., sulfuric acid). According to the Lead-Acid Battery Consortium, 95 to 98 percent of all battery lead is recycled.

Because most EV batteries are recycled, it is unlikely that the increase in battery use would create a significant adverse affect on landfill capacity in California. As mentioned earlier, electric batteries generally hold significant residual value, and 95 to 98 percent of all lead-acid batteries are recycled. In addition, the electric batteries that would power EVs are packaged in battery packs and cannot be as easily disposed of as a single 12-volt conventional vehicle battery. It should be noted that the increased operation of EVs associated with the implementation of the 2012 AQMP may actually result in a reduction of the amount of solid and hazardous waste generated in the SCAQMD's jurisdiction, as NiMH and Li-ion batteries have a much longer life span than conventional lead-acid batteries. Further, their size (over 100 pounds) makes them more difficult to handle and transport for unauthorized disposal. Additionally, the advanced-technology automotive battery recycling industry is setting up operations in states and countries where processing will have no impact on landfills either locally or within the state. Further, EVs do not require the various oil and gasoline filters that are required by vehicles using internal combustion engines. Furthermore, EVs do not require the same type or amount of engine fluids (oil, antifreeze, etc.) that are required by vehicles using internal combustion engines. Used oil and antifreeze are considered hazardous wastes under California regulations.

Even though batteries are comprised of materials with economic value, the increased use of electric batteries may require efforts at preventing disposal of spent batteries in municipal landfills or via illegal dumping. Illegal or improper disposal of electric batteries could result in significant solid waste impacts by allowing hazardous wastes to be disposed in municipal landfills. However, the recycling of batteries is required under law. Further some manufacturers pay $200 for used EV/hybrid batteries. The value, size, and length of life of NiMH and Li-ion batteries are such that recycling is expected to be more predominate than with lead acid batteries. Therefore, the use of EVs and hybrids are not expected to result in an increase in the illegal or improper disposal of electric batteries. Further, batteries associated with electric and hybrid cars are required to be recycled. Therefore, no significant increase in the disposal of hazardous or solid waste is expected due to increased use of electric or hybrid vehicles.

PROJECT-SPECIFIC MITIGATION: Based on the above information, neither solid nor hazardous waste impacts from increased use of electric or hybrid cars associated with the 2012 AQMP are expected to exceed the applicable solid and hazardous waste significance thresholds. Therefore, no mitigation measures are required.

REMAINING SOLID AND HAZARDOUS WASTE IMPACTS: There are no remaining solid and hazardous waste impacts since no significant impacts are expected due to increased use of electric or hybrid cars, and therefore, no mitigation measures are required.

4.8.4.2 Solid Waste Impacts Due to Air Pollution Control Technologies

Table 4.8-1 identifies those proposed control measures that may have potential project specific impacts on solid waste due to the addition of pollution control equipment that use filters, catalysts, etc., to collect and control pollutants, which may eventually need to be disposed and/or replaced. The following proposed control measures could potentially require or incentivize the use of pollution control equipment that use filters, catalysts, etc.: Control Measures BCM-03, MCS-01, CMB-01, INC-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-04, and ADV-05. It is difficult to quantify the number of facilities that would employ these types of equipment, the rate of disposal necessary to maintain the equipment, type of waste generated by the equipment (e.g., hazardous or non-hazardous) and the timing by which these technologies would come into use. However, known control technology historically used is examined qualitatively in the following paragraphs.

4.8.4.2.1 Filters/Precipitators

PROJECT-SPECIFIC IMPACTS: While it is speculative to identify the number of facilities and the quantity of equipment that would utilize filters/precipitators as a result of the proposed control measures, the quantity of particulate matter collected on filters and from electrostatic precipitators is expected to be small. Diesel particulate filters are estimated to collect about 10 to 150 grams of material per vehicle per year (CARB, 2002) which is expected to be considered as hazardous waste. The amount of material collected from these types of control equipment is expected to be minor as described in the following paragraphs and could be handled within the capacity of existing disposal facilities.

The diesel PM filter system consists of a filter positioned in the exhaust stream designed to collect a significant fraction of the PM emissions while allowing the exhaust gases to pass through the system. Since the volume of PM generated by a diesel engine is sufficient to fill up and plug a reasonably sized filter over time, some means of disposing of this trapped PM must be provided. The most promising means of disposal is to burn or oxidize the PM in the filter, thus regenerating, or cleansing, the filter.

A complete filter system consists of the filter and the means to facilitate the regeneration (if not a disposable type filter).. The exhaust temperature of diesel engines is not always sufficient to initiate regeneration in the filter. However, a number of techniques are available to bring about regeneration of filters. It is not uncommon for some of these various techniques to be used in combination. Some of these methods include:

- Using a catalyst coated on the filter element. The application of a base or precious metal coating applied to the surface of the filter reduces the ignition temperature necessary for oxidation of the particulate;
- Using a NOx conversion catalyst upstream of the filter to facilitate oxidation of NO to NO_2 which adsorbs on the collected PM, substantially reducing the temperature required to regenerate the filter;
- Using fuel-borne catalysts to reduce the temperature required for ignition of the accumulated material;
- Throttling the air intake to one or more of the cylinders, thereby increasing the exhaust temperature;
- Using fuel burners, electrical heaters, or combustion of atomized fuel by catalyst to heat the incoming exhaust gas to a temperature sufficient to ignite the PM;
- Using periodically compressed air flowing in the opposite direction of the PM from the filter into a collection bag which is periodically discarded or burned; and
- Throttling the exhaust gas downstream of the filter. This method consists of a butterfly valve with a small orifice in it. The valve restricts the exhaust gas flow, adding back pressure to the engine, thereby causing the temperature of the exhaust gas to rise and initiating combustion.

While it is speculative to identify the number of facilities and the quantity of equipment that would utilize filters as a result of the proposed control measures, the quantity of additional filters being disposed of is expected to be small and could be handled within the capacity of existing disposal facilities. Additionally, the volume of particulate material collected on filters is very small (150 grams per vehicle per year). Based on the above considerations, no significant adverse solid and hazardous waste impacts are anticipated to occur from the use of particulate filters or traps.

State law requires hazardous waste generators to attempt to recycle their wastes before disposing them. The Office of Environmental Health Hazards Assessment (OEHHA) has implemented a hazardous waste exchange program to promote the use, reuse, and exchange of hazardous wastes. The program is designed to assist generators of hazardous wastes to recycle their wastes and encourage the reuse of the wastes. The DTSC also publishes a directory catalog of industrial waste recyclers annually so that industries will know where to buy, sell, or exchange their wastes.

PROJECT SPECIFIC MITIGATION: Based on the above information, neither solid nor hazardous waste impacts from using particulate filters are expected to exceed the applicable significance thresholds because most of the additional waste generated is expected to be relatively small. Therefore, no mitigation measures are required.

REMAINING SOLID AND HAZARDOUS WASTE IMPACTS: Since no significant adverse solid and hazardous waste impacts are expected due to the use of particulate filters, mitigation measures are not required, and solid and hazardous waste impacts remain less than significant.

4.8.4.2.2 Carbon Adsorption

PROJECT-SPECIFIC IMPACT: While none of the proposed solid and hazardous waste control measures specifically designate the use of carbon adsorption as air pollution control equipment, some do encourage a variety of options which could include carbon adsorption. Carbon adsorption is used to control VOC emissions primarily from stationary sources. The amount of solid waste, which may be generated by the carbon adsorption process would depend on the number of carbon adsorbers installed, the operating characteristics, and the frequency of carbon replacement. Most of the control measures have alternative methods of compliance (e.g., reformulation of material).

If carbon adsorption systems are used, the amount of hazardous waste generated on an annual basis is expected to be minimal. Most activated carbon used in carbon adsorption control devices is reclaimed and reactivated, resulting in negligible impacts on solid waste disposal facilities. Activated carbon can have a useful lifetime of five to 10 years; however, the operating characteristics of the control device may result in a shorter lifetime.

Spent carbon is usually recycled and reused rather than disposed in landfills. Most facilities contract out with vendors that take the spent carbon and deliver regenerated carbon. Another alternative to the land disposal of regenerated carbon is to burn the spent carbon in a thermal incinerator. With thermal incineration, the organic materials contained in the carbon are oxidized to carbon dioxide, water, and in most cases, harmless combustion by-products. Incineration destroys the toxic constituents and significantly reduces the volume of carbon to be disposed of, thus reducing solid waste impacts. The disadvantage of incineration is that without additional add-on control devices, there may be an increase in criteria pollutant emissions.

Further, it is not expected that carbon adsorption will be used in a majority of the cases where it is as a control option. It is expected that facilities will continue to choose other more cost-effective options to comply with control measures. Based on these considerations, the solid waste impacts resulting from the use of carbon adsorption are expected to be less than significant.

PROJECT SPECIFIC MITIGATION: Based on the above information, neither solid nor hazardous waste impacts from using carbon adsorption control equipment are expected to exceed the applicable significance thresholds because most of the additional waste generated is expected to be relatively small. Therefore, no mitigation measures are required.

REMAINING SOLID AND HAZARDOUS WASTE IMPACTS: Since no significant adverse solid and hazardous waste impacts are expected due to the use of carbon adsorption control equipment, mitigation measures are not required, and solid and hazardous waste impacts remain less than significant.

4.8.4.2.3 Particulate Traps/Prefilters/Filters/HEPA Filters

PROJECT-SPECIFIC IMPACTS: A number of control measures in the 2012 AQMP could require the collection and disposal of additional particulate matter including BCM-03, MCS-01, INC-01, and OFFRD-03. These measures could result in increased collection of particulate matter that would then need to be disposed.

Baghouses, pre-filters, filters, and HEPA filters collect particulate emissions from stationary and mobile sources of particulate emissions. These types of filtration control equipment can effectively remove particulate matter, including heavy metals, asbestos, as well as other toxic and nontoxic compounds. Polytetrafluoroethylene (PTFE) membranes or HEPA filters can increase a system's removal efficiency up to 99.9 percent. In general, as particulate size decreases, the surface area to volume ratio increases, thus, increasing the capacity of these filters to adsorb smaller particles (including hazardous materials). An increase in the use of membranes and filters may result in an incremental increase of solid waste requiring disposal in landfills over what would be produced if the 2012 AQMP were not adopted. In some cases, waste generated will be hazardous (e.g., the collection of toxic emissions). The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter is expected to be minimal, because filtration control equipment is already used in practice or required by existing rules, especially for stationary sources. Control measures that may include filtration control equipment will generally require increased control efficiencies and/or better housekeeping and maintenance requirements for the filtration devices. As a result the incremental amount of material collected by filters is expected to be small. Further, the larger filters used in baghhouses are cleaned and reused, so minimal additional waste would be expected from collecting more PM due to greater efficiency. Therefore, the potential impacts from the use of additional filtration equipment on solid and hazardous waste generation are less than significant.

PROJECT SPECIFIC MITIGATION: Based on the above information, neither solid nor hazardous waste impacts from using baghouses, pre-filters, filters, and HEPA filters are expected to exceed the applicable significance thresholds because the most of the additional waste generated is expected to be relatively small. Therefore, no mitigation measures are required.

REMAINING SOLID AND HAZARDOUS WASTE IMPACTS: Since no significant adverse solid and hazardous waste impacts are expected due to the use of baghouses, pre-filters, filters, and HEPA filters, mitigation measures are not required, and solid and hazardous waste impacts remain less than significant.

4.8.4.2.4 Catalytic Oxidation

PROJECT-SPECIFIC IMPACTS: The 2012 AQMP could result in the increased use of catalytic oxidation to control emissions. The following control measures could rely on catalytic oxidation technologies for emission control: Control Measures CMB-01, OFFRD-03, OFFRD-04, ADV-04, and ADV-05. Catalytic oxidation beds generally use a precious metal to aid in the combustion of air pollutants at relatively low temperatures. Catalytic oxidizers require periodic replacement of the catalyst bed. The expected life of the catalyst is approximately three to five years, depending on the concentration of materials and type of exhaust flows controlled. Metals used in the catalyst are generally recovered because they are made from precious and valuable metals (e.g., platinum and palladium). Metals can be recovered from approximately 60 percent of the spent catalyst generated from the operation of catalytic oxidizers (SCAQMD, 2003a). These metals could then be recycled. The remaining material would most likely need to be disposed of at a hazardous waste landfill.

If the catalyst is not hazardous, jurisdiction for its disposal then shifts to local agencies such as regional water quality control boards (RWQCBs) or county environmental agencies. The RWQCB has indicated that if a spent catalyst is not considered a hazardous waste, it would probably be considered a Designated Waste. A Designated Waste is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could cause degradation of the waters of the state. The type of landfill that the material is disposed at will depend upon its final waste designation. Due to the recycling of catalysts used in catalytic oxidation and the fact that this technology is not expected to be widely used because of cost, no significant impacts on waste disposal are expected.

PROJECT SPECIFIC MITIGATION: Based on the above information, neither solid nor hazardous waste impacts from using catalytic oxidation control technologies are expected to exceed the applicable significance thresholds because the most of the additional waste generated is expected to be relatively small. Therefore, no mitigation measures are required.

REMAINING SOLID AND HAZARDOUS WASTE IMPACTS: Since no significant adverse solid and hazardous waste impacts are expected due to the use of catalytic oxidation control technologies, mitigation measures are not required, and solid and hazardous waste impacts remain less than significant.

4.8.4.3 Solid Waste Impacts Due to the Retirement of Equipment

Control Measures IND-01, MCS-01, CMB-01, CMB-02, CMB-03, INC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, ADV-01, ADV-02, ADV-05, ADV-06, and ADV-07 could result in the early retirement of equipment (e.g., burners, on-road trucks and vehicles, off-road vehicles, gasoline fueled engines, diesel fueled engines, and locomotive and aircraft engines). Solid waste impacts could occur since the older equipment or vehicle parts would be taken out of service in the district and scrapped and disposed of in district landfills. It is expected that some older trucks, vehicles, and locomotive engines could be relocated to other areas, such as Mexico.

Approximately 80 percent of a vehicle can be recycled and reused in another capacity. Batteries, catalytic converters, tires, and other recoverable materials (e.g., metal components) are removed and the metal components of the vehicle are shredded. The shredded material is then sent for recovery of metal content. Therefore, the amount of solid waste landfilled as a result of the proposed control measures would be relatively small since most of the parts being replaced have commercial value as scrap metal. Currently, there are a limited number of vehicles and parts that can be scrapped per year because of the limited number of scrapping and recycling facilities in the district. It is expected that gasoline and diesel engines could also be recycled for metal content, or rebuilt and sold to other areas. It is expected that parts and equipment would be scrapped in the near future, regardless of the 2012 AQMP control measures as they are older vehicles or have older components. The primary solid waste impact is expected to be accelerated replacement and disposal of equipment and parts before the end of their useful life. Further, these control measures are not expected to mandate that older vehicles, engines, or other equipment be scrapped. The control measures are expected to allow a number of different control methods to comply with the required emission reductions. The most cost effective control measures would be expected to be implemented. Control measures that would require new equipment will generally require that retirement occurs as the life of the old equipment is exhausted and new equipment is put into service. Based on the above, scrap metal from vehicle and engine replacements are expected to be recycled and not disposed of in landfills. Any small increase that may occur from miscellaneous parts is expected to be within the total permitted capacity of over 100,000 tons per day for all facilities in the district, so that no significant impacts would be expected.

The California Integrated Waste Management Act of 1989 (AB 939) requires cities and counties in California to reduce the amount of solid waste disposed in landfills by 25 percent by 1995 and by 50 percent by 2000, through source reduction, recycling and composting activities. Later legislation mandates a 50 percent diversion requirement be achieved every year. SB 1016 (Wiggins) – Diversion: Alternative Compliance System (effective January 1, 2009) moves CalRecycle from the previously existing solid waste diversion accounting system to a per capita disposal based system. SB 1016 does not change the 50 percent requirement in AB 939, rather measures it differently. Compliance is the same under the new system as it was under the old system. To evaluate compliance, CalRecycle will look at a jurisdiction's per capita disposal rate as an indicator of how well its programs are doing to keep disposal at or below a jurisdiction's unique 50 percent equivalent per capita disposal target. The 50 percent equivalent per capita disposal target is the amount of disposal a jurisdiction would have had during the base period had it been at exactly a 50 percent diversion rate. The target is calculated using the average of 2003-2006 per capita generation for each jurisdiction. The generation average is then divided in half to determine the 50 percent equivalent per capita disposal target. This number does not determine compliance. Compliance is based on CalRecycle evaluating that a jurisdiction is continuing to implement the programs it choses and is making progress in meeting its target (CalRecyle, 2012a).

In 2010, California's statewide disposal was 30.4 million tons and population was 37.2 million residents. This resulted in a per resident disposal rate of 4.5 pounds/resident/day. The rate was the same in 2009 (CalRecycle, 2012c).

Almost all (99 percent) of California's 30.4 million tons of disposed~~al~~ waste was ~~were~~ landfilled in California, while approximately one percent was exported to landfills out of state. An additional 0.8 million tons were transformed at three permitted waste-to energy plants in California, but not included in the disposal rate estimate because of provisions in the law that allow limited diversion credit for transformation (CalRecycle, 2012c).

California's disposal of 30.4 million tons in 2010 is a slight decline of 0.7 million tons from 2009. However, it is 13.6 million tons less than the high of 44 million tons in 1989, and 12.1 million tons less than the second highest amount of 42.5 million tons recently recorded in 2005. In 2010, the per employee disposal rate reached a historic low of 11.7 pounds per employee per day, per resident "diversion rate equivalent" was 65 percent, and per employee "diversion rate equivalent was 63 percent (CalRecycle, 2012c).

In the future, it is anticipated that the California economy will rebound and solid waste generation will increase as people find work, build more, produce more, and buy more. Statewide disposal is expected to increase in the likely event of an economic rebound. If these increased flows of materials are not planned for, they may end up in landfills rather than being recycled back into the economy.

Many cities and counties had not met the 20 and 50 percent waste reduction goals of AB 939 prior to the adoption of the 50 percent equivalent per capita disposal target associated with SB 1016. Table 4.8-3 shows that within the counties within the district as well as statewide, targets are still short of meeting diversion standards. The generation of additional waste associated with control measures in the 2012 AQMP could impact the abilities of cities and counties to further reduce wastes. However, as discussed above the increase in solid waste that is expected to be diverted to a landfill is small and many of the waste streams are recyclable. Therefore, the 2012 AQMP is not expected to have adverse impacts on landfills.

TABLE 4.8-3

Summary of Per Capita Target Compliance (2010)

LOCATION	NUMBER OF JURISDICTIONS WITHIN LOCATION	NUMBER OF JURISDICTIONS MEETING POPULATION TARGET	PERCENT OF JURISDICTIONS MEETING POPULATION TARGET	NUMBER OF JURISDICTIONS MEETING EMPLOYEE TARGET	PERCENT OF JURISDICTIONS MEETING EMPLOYEE TARGET
State of California	415	18	4%	51	12%
Los Angeles County	74	2	3%	4	5%
Orange County	35	1	3%	2	6%
Riverside County	25	0	0%	4	16%
San Bernardino County	26	0	0%	2	8%

Source (CalRecyle, 2012b)

PROJECT SPECIFIC MITIGATION: Due to the monetary value of scrapped engines, vehicles and equipment, significant solid or hazardous impacts associated with the early retirement of such equipment were not identified, are not significant and, therefore, no mitigation measures are required.

REMAINING SOLID AND HAZARDOUS WASTE IMPACTS: Since no significant adverse solid and hazardous waste impacts are expected due to scrapped engines, vehicles and equipmen, mitigation measures are not required, and solid and hazardous waste impacts remain less than significant.

4.8.5 Summary of Solid and Hazardous Waste Impacts

The following is a summary of the conclusions of the analysis of solid and hazardous wastes impacts associated with implementation of the 2012 AQMP.

- Spent Batteries: The analysis indicates that no significant solid and hazardous waste impacts associated with spent batteries are likely to occur because due to battery recycling. Lead acid batteries are currently required to be recycled. NiMH and Li-ion batteries more common with EVs and hybrids have a long battery life, are valuable, and usually have a monetary incentive associated with return of the battery to the manufacturer. Two firms in the United States are currently recycling NiMH and Li-ion batteries. For these reasons, the increased use of EVs and hybrids are not expected to result in a significant increase in the illegal disposal of batteries.

- Solid and Hazardous Waste Impacts due to Air Pollution Control Technologies: No significant solid and hazardous waste impacts were identified due to air pollution control technologies as part of the 2012 AQMP. The solid and hazardous waste impacts associated with the use of carbon adsorption are considered less than significant, since spent carbon is usually recycled and reused rather than disposed in landfills. The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter from the control technologies are expected to be minimal as the amount of material collected is small. Finally the impacts associated with catalytic oxidation are not expected to be significant because the catalysts used are largely recycled; therefore, no significant impacts on solid or hazardous waste disposal are expected.

- Early Retirement of Equipment: Control measures that would require new equipment can require that retirement occurs as the life of the old equipment is exhausted and new equipment is put into service. For equipment that may be retired before the end of its useful life, that equipment may be reused in areas outside the district. Equipment with no remaining useful life is expected to be recycled for metal content. Therefore, no significant solid and hazardous waste impacts were identified due to implementation of the control measures.

Summary of PM2.5 Control Measure Impacts: The impacts associated with PM2.5 Control Measures were evaluated and determined to be less than significant for solid and hazardous waste generation (CMB-01, BCM-02, BCM-03, BCM-04, IND-01, EDU-01 and MCS-01).

Summary of Ozone Control Measure Impacts: The Ozone Control Measures were evaluated and determined to be less than significant for solid and hazardous waste generation (CMB-01, CMB-02, CMB-03, INC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07).

SUBCHAPTER 4.9

TRANSPORTATION AND TRAFFIC

4.9 TRANSPORTATION AND TRAFFIC

4.9.1 Introduction

This subchapter examines impacts on the potential transportation and traffic impacts associated with implementation of the proposed control measures in the 2012 AQMP.

4.9.2 2012 AQMP Control Measures with Potential Traffic Impacts

All of the proposed control measures in the 2012 AQMP were evaluated and only three control measures, ONRD-05, ADV-01, and ADV-02, were found to potentially impact traffic.

ONRD-05 identifies as compliance options zero-emission container movement technologies (e.g., no creation of tailpipe emissions) for vehicles or systems that transport containers between marine ports and near-dock railyards[1]. Zero-emission container movement systems include, but are not limited to, on-road technologies such as battery-electric trucks, fuel cell trucks, hybrid-electric trucks with all-electric range and zero-emission hybrid or battery-electric trucks with “wayside” power (such as electricity from overhead wires). The measure could also be implemented by constructing zero-emission fixed guideway systems in the roadway such as electric, maglev or linear synchronous motor propulsion. If implemented, ONRD-05 would require an additional demand for electricity to be powered by grid electricity stored in a battery, by electricity produced onboard the vehicle through a fuel cell, or by “wayside” electricity from outside sources by constructing new overhead catenary lines or wires on roadways between the marine ports and the near-dock railyards.

ADV-01 identifies as compliance options advance on-road freight transport equipment that is powered by clean energy technologies, such as advanced engine controls for more efficient combustion, electric hybrid systems and zero-emission technologies such as electric, battery-electric, and fuel cells, and a greater use of alternative and renewable fuels. Under ADV-01, an additional demand for electricity is also likely and could be supplied by the construction of overhead catenary electrical lines adjacent to and within existing streets and roadways. Lastly, implementation of ADV-01 could also result in the construction of "wayside" electric or magnetic power built into the existing roadway infrastructure to boost the pulling capacity or range of the heavy-duty vehicles as well as battery changing or fueling infrastructure.

ADV-02 focuses on deploying zero- and near-zero emission locomotives. The following technologies could be applied toward achieving zero emissions from freight and passenger locomotives: overhead catenary electrical lines, "wayside" electric or magnetic power built into the existing railway infrastructure, linear synchronous motor technology, battery-hybrid systems, fuel cells, and alternative fuels such as LNG.

Table 4.9-1 contains a summary of these control measures and their corresponding potential traffic impacts.

[1] Near-dock railyards are railyards located less than five miles from marine terminals.

TABLE 4.9-1

Control Measures with Potential Traffic Impacts

CONTROL MEASURE	CONTROL MEASURE DESCRIPTION (POLLUTANT)	CONTROL METHODOLOGY	TRAFFIC IMPACT
ONRD-05	Further Emission Reductions from Heavy-Duty Vehicles Servicing Near-Dock Railyards (NOx, PM)	Incentives to replace up to 1,000 heavy-duty vehicles with low-emitting vehicles or zero-emission container movement systems.	Potential traffic impacts due to the construction of overhead catenary lines and fixed guideway systems. Potential traffic impacts associated with operation activities associated with transportation infrastructure improvements (e.g., dedicating an existing truck lane exclusive to vehicles using the overhead catenary electrical lines or fixed guideway systems).
ADV-01	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission On-Road Heavy-Duty Vehicles (NOx)	Construct "wayside" electric or magnetic infrastructure; construct battery charging and fueling infrastructure. Alternatively, if battery, fuel cell or other zero/near zero emission technologies progress sufficiently, the need for wayside power for rail or trucks may be diminished or eliminated.	Potential traffic impacts associated with construction activities to develop electrical-support systems (e.g., overhead catenary electrical lines and battery charging stations) and fueling infrastructure adjacent to and within existing streets and roadways. Potential traffic impacts associated with operation activities associated with transportation infrastructure improvements (e.g., dedicating an existing truck lane exclusive to vehicles using the overhead catenary electrical lines).
ADV-02	Proposed Implementation Measures for the Deployment of Zero- and Near-Zero Emission Locomotives (NOx)	Construct "wayside" electric, magnetic, battery-hybrid system, or fuel cell infrastructure, construct battery charging or fueling infrastructure.	Potential traffic impacts from construction of overhead catenary electrical lines, "wayside" electric or magnetic infrastructure.

4.9.3 Significance Criteria

Implementation of the 2012 AQMP will be considered to have significant adverse transportation and traffic impacts if any of the following conditions occur:

- Peak period levels on major arterials are disrupted to a point where level of service (LOS) is reduced to D, E or F for more than one month.
- An intersection's volume to capacity ratio increase by 0.02 (two percent) or more when the LOS is already D, E or F.
- A major roadway is closed to all through traffic, and no alternate route is available.
- The project conflicts with applicable policies, plans or programs establishing measures of effectiveness, thereby decreasing the performance or safety of any mode of transportation.
- There is an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system.
- The demand for parking facilities is substantially increased.
- Water borne, rail car or air traffic is substantially altered.
- Traffic hazards to motor vehicles, bicyclists or pedestrians are substantially increased.
- The need for more than 350 employees.
- An increase in heavy-duty transport truck traffic to and/or from the facility by more than 350 truck round trips per day.
- Increase customer traffic by more than 700 visits per day.

4.9.4 Potential Impacts and Mitigation

Potential traffic impacts associated with the 2012 AQMP during construction relate primarily to the construction of the following support systems: 1) catenary overhead electrical lines; 2) battery charging stations; 3) fueling infrastructure; 4) "wayside" electric; and, 5) magnetic infrastructure. Potential traffic operational impacts associated with the 2012 AQMP relate primarily to dedicating an existing truck lane exclusive to vehicles using the overhead catenary electrical lines. For purposes of evaluating potential traffic impacts, it has been assumed herein that no new rail or roadways will be constructed, but rather some of the existing routes/corridors may be modified.

PROJECT-SPECIFIC IMPACTS: The existing rail and truck routes/corridors likely to be modified are located primarily in commercial and industrial zones within the Southern California area. Examples of these areas include, but are not limited to, the Port of Los Angeles, Port of Long Beach, and industrial areas in and around container transfer facilities (rail and truck) near the Terminal Island Freeway, along the Alameda Corridor, as well as inland facilities. Since only existing transportation routes would be modified, no new roadways or railways are anticipated as part of the proposed project.

Construction Activities: Implementation of Control Measures ONRD-05 and ADV-01 could require the installation of catenary overhead electrical lines and fixed guideway systems, battery charging stations, and fueling infrastructure within or adjacent to existing roadways, streets, freeways, and/or transportation corridors. Implementation of Control Measure ADV-02 could require the installation of catenary overhead electrical lines or electrical or magnetic infrastructure along rail lines. Construction activities would generate traffic associated with construction worker vehicles and trucks delivering equipment, materials and supplies to the project site during the duration of the construction activities. Heavy construction equipment such as backhoes, cranes, cherry pickers, front end loaders and other types of equipment would be used to carry-out the aforementioned construction activities. Construction activities would be expected to occur within or adjacent to existing roadways which could require lane closures to protect construction workers and avoid traffic conflicts. These construction activities are expected to occur along heavily travelled roadways (e.g., roads near the ports, such as Sepulveda Boulevard, Terminal Island Freeway, on Navy Way at the Port of Los Angeles, and Alameda Street). Construction traffic could potentially result in increased traffic volumes on heavily traveled streets and require temporary lane closures. Construction activities may result in the following impacts:

- Temporary reduction in the level of service on major arterials.
- Temporary closure of a roadway or major arterial.
- Temporary closure of a railroad line.
- Temporary impact on businesses or residents within the construction area.
- Removal of on-street parking.
- Conflicts with public transportation system (e.g., temporary removal of bus stops).

Construction activities necessary to modify existing rail and truck routes/corridors would vary depending on the location, and the specific traffic impacts are unknown. As such, to identify any impacts at this time without knowing the specific design features would be speculative. When the details become available, project-specific impacts would require a separate CEQA evaluation. However, the above listed construction traffic impacts, although temporary in nature, could be significant and result in a reduction of LOS at local intersections and potentially impact roadways within the applicable county's congestion management plan.

Operational Activities: Because Control Measures ONRD-05, ADV-01, and ADV-02 would apply to existing transportation corridors, no new streets, roads, freeways, or rail lines are expected to be needed as part of implementing the 2012 AQMP. However, implementation of Control Measures ONRD-05 and ADV-01 may contribute to significant adverse operational traffic impacts on roadways because transportation infrastructure improvements pertaining to overhead catenary electrical lines could require the dedication of an existing lane exclusive to vehicles using the overhead catenary electrical lines or fixed guideway systems. The dedication of an existing lane would mean that other vehicles would have reduced access to available driving lanes. Thus, a reduction in the number of available lanes on a roadway to accommodate vehicles using the overhead catenary electrical lines could adversely affect traffic and congestion for all other vehicles on the road.

The number of plug-in hybrid vehicles, battery electric vehicles, and fuel cell vehicles that will be driving on district roadways are projected to substantially increase between year 2013 and year 2025, because Control Measure ONRD-03 would accelerate the penetration of zero emission vehicle trucks (1,000 zero emission vehicle trucks by 2023). This means from 2013 to 2023 there would be approximately 91 more zero emission vehicle trucks per year (e.g., 1,000 trucks per year divided by 11 years equals 91 trucks per year). In addition, Control Measure ONRD-05 calls for 1,000 more zero emission vehicle trucks by 2020. This means approximately 167 additional zero emission vehicle trucks per year from 2015 to 2020. (As a reminder, ONRD-05 only affects trucks going from the ports to near-dock transfer nodes. By definition near-dock means within five miles of the ports.) Table 4.9-2 contains a summary of the projected increases over the baseline of near-zero and zero emission vehicles that may result from implementing Control Measures ONRD-03 and ONRD-05.

TABLE 4.9-2

Projected Increases Near-Zero and Zero Emission Vehicles
from ONRD-03 and ONRD-05

YEAR	BASELINE NEAR-ZERO & ZERO EMISSION VEHICLES	ADDITIONAL NEAR-ZERO & ZERO EMISSION VEHICLES FROM ONRD-03	ADDITIONAL NEAR-ZERO & ZERO EMISSION VEHICLES FROM ONRD-03	TOTAL ADDITIONAL VEHICLES FROM ONRD03 + ONRD-05
2013	23,055	91	--	23,146
2014	31,160	91	--	31,251
2015	45,146	91	167	45,404
2016	59,976	91	167	60,234
2017	74,839	91	167	75,097
2018	105,211	91	167	105,469
2019	147,767	91	167	148,025
2020	201,256	91	167	201,514
2021	262,241	91	--	262,332
2022	332,639	91	--	332,730
2023	412,355	91	--	412,446
2024	500,607	--	--	500,607
2025	595,397	--	--	595,397

Source: Communication with ARB Staff, Mobile Source Division, August 14, 2012.

Similarly, implementation of ADV-02 may alter railway traffic due to infrastructure improvements pertaining to overhead catenary electrical lines. However, specific design features are unknown at this time. As such, to identify any impacts at this time without knowing the specific design features would be speculative. Nonetheless, when details of the project become available, any proposed modifications to an existing rail or truck traffic route/corridor will require a separate CEQA evaluation to analyze specific traffic impacts and identify appropriate mitigation measures. Never-the-less, a reduction in the number of available lanes on a roadway to accommodate vehicles using the overhead catenary electrical lines could adversely affect traffic and congestion for all other vehicles on the road.

PROJECT-SPECIFIC MITIGATION: The impact of the proposed project on traffic and circulation during construction, although temporary in nature, could be significant. In addition, the impact of the proposed project on traffic and circulation during operation, could be significant if an existing roadway is dedicated exclusively as a truck lane for vehicles using the overhead catenary electrical lines or fixed guideway systems because traffic patterns and congestion may be altered. In order to mitigate potential construction and operation traffic impacts, project-specific information would be necessary in order to first identify the specific impacts (e.g., project location, distance of roadway to be altered, etc.) to develop appropriate mitigation measures.

Ultimately, mitigation measures, both for construction and operation, would need be identified on a project-by-project basis and would be the responsibility of the lead agencies based on their underlying legal authority to mitigate project impacts. For example, in the Draft Program EIR prepared for SCAG's 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy, mitigation measure TR29 (MM-TR29) identifies mitigation measures for traffic congestion management during construction as follows:

TT-1: Project sponsors and construction contractors can and should meet with the appropriate Lead Agency (or other government agency) to determine traffic management strategies to reduce, to the maximum extent feasible, traffic congestion and the effects of parking demand by construction workers during construction of this project and other nearby projects that could be simultaneously under construction. The project sponsor should develop a construction management plan for review and approval by the Lead Agency (or other government agency as appropriate). The plan should include at least the following items and requirements:

- A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak traffic hours, detour signs if required, lane closure procedures, signs, cones for drivers, and designated construction access routes.

- Notification procedures for adjacent property owners and public safety personnel regarding when major deliveries, detours, and lane closures will occur.

- Location of construction staging areas for materials, equipment, and vehicles at an approved location.

- A process for responding to, and tracking, complaints pertaining to construction activity, including identification of an onsite complaint manager. The manager should determine the cause of the complaints and should take prompt action to correct the problem. The Lead Agency should be informed who the Manager is prior to the issuance of the first permit.

- Provision for accommodation of pedestrian flow.

- As necessary, provision for parking management and spaces for all construction workers to ensure that construction workers do not park in on street spaces.

- Any damage to the street caused by heavy equipment, or as a result of this construction, should be repaired, at the project sponsor's expense, within one week of the occurrence of the damage (or excessive wear), unless further damage/excessive wear may continue; in such case, repair should occur prior to issuance of a final inspection of the building permit. All damage that is a threat to public health or safety should be repaired immediately. The street should be restored to its condition prior to the new construction as established by the Lead Agency (or other appropriate government agency) and/or photo documentation, at the sponsor's expense, before the issuance of a Certificate of Occupancy.

- Any heavy equipment brought to the construction site should be transported by truck, where feasible.

- No materials or equipment should be stored on the traveled roadway at any time.

- Prior to construction, a portable toilet facility and a debris box should be installed on the site, and properly maintained through project completion.

- All equipment should be equipped with mufflers.

- Prior to the end of each work-day during construction, the contractor or contractors should pick up and properly dispose of all litter resulting from or related to the project, whether located on the property, within the public rights-of-way, or properties of adjacent or nearby neighbors.

As a single purpose public agency responsible for adopting and enforcing air quality rules and regulations, the SCAQMD's authority to implement mitigation measures for traffic impacts is limited. CEQA is intended to be implemented in conjunction with discretionary powers granted to public agencies by other laws (CEQA Guidelines §14040(a)). Further, the CEQA Guidelines (§15040(b)) specifically state, "CEQA does not grant an agency new powers independent of the powers granted to the agency by other laws." Thus, it is not feasible for the SCAQMD to identify appropriate project-specific mitigation measures for traffic and transportation impacts in this Final Program EIR.

Identification and adoption of mitigation of traffic and transportation impacts would primarily be the responsibility of the local general purpose public agency (e.g., city or county) or other agency that would typically serve as the lead agency on any given future project. Thus, appropriate project-specific mitigation measures would have to be identified by the applicable lead agency, such as SCAG's MM-TR29, in the CEQA document prepared for each future project that is proposed. Since MM-TR29 is currently an adopted mitigation measure from SCAG's 2012 – 2035 RTP/SCS, the SCAQMD recommends that it be implemented for all projects that have the potential to affect roadways, including 2012 AQMP Control Measures ONRD-05, ADV-01, and ADV-02.

In conclusion, the SCAQMD cannot predict how a future lead agency might choose to mitigate a particular significant traffic and transportation impact. Because the catenary lines are expected to be utilized in areas where truck traffic is concentrated and could occur in heavy traffic areas (e.g., Alameda Corridor and downtown Los Angeles) the potential exists for future traffic and transportation impacts to be significant and unavoidable (e.g., significant even after feasible mitigation measures are identified and imposed).

REMAINING IMPACTS – USE OF CATALYSTS: The impacts of the proposed project on traffic and transportation are expected to be significant prior to mitigation. While generally mitigation measures could help minimize some of the impacts, SCAQMD cannot predict how a future lead agency might choose to mitigate a particular significant traffic and transportation. Thus, the potential exists for future traffic and transportation impacts to be significant even after feasible mitigation measures are identified and imposed. Therefore, traffic and transportation impacts that may occur as a result of implementing the 2012 AQMP are expected to remain significant.

4.9.5 Summary of Traffic Impacts

The following is the summary of the conclusions of the analysis of the traffic impacts associated with implementation of the 2012 AQMP.

- Construction impacts, though temporary in nature, could be significant.
- Operational impacts could be significant.
- Any proposed modification to an existing rail or truck traffic route/corridor will require a separate CEQA evaluation to identify specific traffic impacts and mitigation measures for that project.

Summary of PM2.5 Control Measure Impacts: PM2.5 Control Measures were evaluated in the NOP/IS and it was determined that the PM2.5 Control Measures would not generate any potentially significant traffic impacts. Since no significant traffic impacts were identified for any of the PM2.5 Control Measures, no mitigation measures are required.

Summary of Ozone Control Measure Impacts: Three Ozone Control Measures (e.g., ONRD-05, ADV-01, and ADV-02) could result in traffic impacts due to construction and operation. The potential traffic impacts of these Ozone Control Measures were determined to be significant and mitigation measures would be required. However, it is not feasible to identify appropriate project-specific mitigation measures for traffic and transportation impacts in this Final Program EIR. Instead, appropriate project-specific mitigation measures will have to be identified in the CEQA document prepared for each future project that is proposed. The analysis concluded that the potential exists for future traffic and transportation impacts to be significant and unavoidable (e.g., significant even after feasible mitigation measures are identified and imposed).

SUBCHAPTER 4.10

OTHER CEQA TOPICS

Growth-Inducing Impacts

Significant Environmental Effects Which Cannot Be Avoided

Relationship Between Short-Term Uses and Long-Term Productivity

Environmental Effects Not Found to Be Significant

4.10 OTHER CEQA TOPICS

4.10.1 Growth-Inducing Impacts

CEQA defines growth-inducing impacts as those impacts of a proposed project that "could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects, which would remove obstacles to population growth" (CEQA Guidelines §15126.2 (d)).

To address this issue, potential growth-inducing effects are examined through the following considerations:

- Facilitation of economic effects that could result in other activities that could significantly affect the environment;
- Expansion requirements for one or more public services to maintain desired levels of service as a result of the proposed project;
- Removal of obstacles to growth through the construction or extension of major infrastructure facilities that do not presently exist in the project area or through changes in existing regulations pertaining to land development;
- Adding development or encroachment into open space; and/or
- Setting a precedent that could encourage and facilitate other activities that could significantly affect the environment.

4.10.1.1 Economic and Population Growth, and Related Public Services

The proposed project would not directly foster economic or population growth or the construction of new housing in the southern California area. The control measures contained in the 2012 AQMP accommodate the projected growth for the region while still resulting in compliance with the federal 24-hour PM2.5 ambient air quality standards and making expeditious progress towards attaining the federal one-hour and eight-hour ozone standards. However, the 2012 AQMP would not be the cause of residential, commercial, industrial, and infrastructure development.

A project would directly induce growth if it would directly foster economic or population growth or the construction of new housing in the surrounding environment (e.g., if it would remove an obstacle to growth by expanding existing infrastructure such as new roads or wastewater treatment plants). The 2012 AQMP would not remove barriers to population growth, as it involves no changes to a General Plan, zoning ordinance, or a related land use policy. Alternatively, the 2012 AQMP would not create barriers to projected population growth because it would result in avoiding sanctions or implementation of a Federal Implementation Plan, which could increase the New Source Review emission offset ratio or result in highway funding sanctions.

The 2012 AQMP does not include policies that would encourage the development of new housing or population-generating uses or infrastructure that would directly encourage such uses. The 2012 AQMP may indirectly increase the efficiency of the region's urban form through encouraging more air quality efficient development patterns. The 2012 AQMP does not change jurisdictional authority or responsibility concerning land use or property issues. Land use authority falls solely under the purview of the local governments. The SCAQMD is specifically excluded from infringing on existing city or county land use authority (California Health & Safety Code §40414). Therefore, the 2012 AQMP would not directly trigger new residential development in the area.

The 2012 AQMP may result in construction activities associated with implementation of certain control measures (e.g., control equipment at existing stationary sources or electrification along existing roadways). However, the 2012 AQMP would not directly or indirectly stimulate substantial population growth, remove obstacles to population growth, or necessitate the construction of new community facilities that would lead to additional growth in the Basin. It is expected that construction workers will be largely drawn from the existing workforce pool in southern California.

Considering the existing workforce in the region and current unemployment rates, it is expected that a sufficient number of workers are available locally and that few or no workers would relocate for construction jobs potentially created by the 2012 AQMP as construction activities would be spread over a period of about 10 years. Further, the 2012 AQMP would not be expected to result in an increase in local population, housing, or associated public services (e.g., fire, police, schools, recreation, and library facilities) since no increase in population or the permanent number of workers is expected. Likewise, the proposed project would not create new demand for secondary services, including regional or specialty retail, restaurant or food delivery, recreation, or entertainment uses. As such, the 2012 AQMP would not foster economic or population growth in the surrounding area in a manner that would be growth-inducing.

4.10.1.2 Removal of Obstacles to Growth

The 2012 AQMP is located within an existing urbanized area where adequate infrastructure is already in place to serve the existing surrounding population. The proposed project would not employ activities or uses that would result in growth inducement, such as the development of new infrastructure (e.g., new roadway access or utilities) that would directly or indirectly cause the growth of new populations, communities, or currently undeveloped areas. The 2012 AQMP would require additional energy (electricity and potentially natural gas) but the increased energy requirements are expected to be within those projected for existing population growth of the region. The 2012 AQMP also encourages energy efficiency to minimize energy use. The 2012 AQMP may also result in the construction of overhead catenary lines to electrify existing roadways and transportation corridors. These transportation measures are expected to use existing roadways and are not expected to require the development of new roads or freeways. Likewise, the proposed project would not result in an expansion of existing public service facilities (e.g., police, fire, libraries, and schools) or the development of public service facilities that do not already exist.

4.10.1.3 Development or Encroachments into Open Space

Development can be considered growth-inducing when it is not contiguous to existing urban development and introduces development into open space areas. The proposed project is situated within the existing South Coast Air Basin, which is urbanized. The areas of the Basin where construction activities may occur would be at existing stationary sources and along transportation corridors. Stationary sources are generally located within commercial and industrial (urbanized) areas. Any related construction activities would be expected to be within the confines of the existing facilities and would not encroach into open space. The 2012 AQMP may also result in the construction of overhead catenary lines to electrify roadways and transportation corridors. These transportation measures are expected to use existing roadways and are not expected to require the development of new roads or freeways. Therefore, the 2012 AQMP would not result in development within or encroachment into an open space area.

4.10.1.4 Precedent Setting Action

The 2012 AQMP demonstrates attainment of the federal 24-hour PM2.5 standard by 2014 in the Basin through the adoption of all feasible control measures, and also provides updates to the 8-hour ozone control plan. The federal Clean Air Act requires a 24-hour PM2.5 non-attainment area to prepare a State Implementation Plan which must be submitted to the U.S. EPA. Therefore, the 2012 AQMP is being prepared to comply with state and federal air quality planning regulations and requirements. These required approvals are routine compliance actions and would not result in precedent-setting actions that might cause other significant environmental impacts (other than those evaluated in other sections of this Final Program EIR).

4.10.1.5 Conclusion

The 2012 AQMP was developed to comply with state and federal air quality planning requirements. The 2012 AQMP is not expected to foster economic or population growth or result in the construction of additional housing or other infrastructure, either directly or indirectly, that would further encourage growth. The 2012 AQMP could result in construction projects at existing stationary sources and along existing transportation corridors. However, the proposed project would not be considered growth-inducing, because it would not result in an increase in production of resources or cause a progression of growth that could significantly affect the environment either individually or cumulatively.

4.10.2 Significant Environmental Effects Which Cannot Be Avoided

Section 15126.2 (b) of the CEQA Guidelines requires that an EIR describe significant environmental impacts that cannot be avoided, including those effects that can be mitigated but not reduced to a less than significant level. Irreversible changes include a large commitment of nonrenewable resources, committing future generations to specific uses of the environment (e.g., converting undeveloped land to urban uses), or enduring environmental damage due to an accident. The following is a summary of impacts associated with the 2012 AQMP that this ~~Draft~~ Final Program EIR concluded are significant and unavoidable. These impacts are also described in detail in the preceding portions of Chapter 4.0 of this Final Program EIR.

- Air quality impacts associated with construction activities due to the implementation of the control measures in the 2012 AQMP were considered to be potentially significant for CO and PM10 emissions.

- The increased demand for electricity and natural gas associated with the 2012 AQMP control measures is considered to be significant.

- Water demand associated with the manufacture and use of waterborne coatings, solvents and other consumer products, and add-on air pollution control technologies are potentially significant. While mitigation measures are available, they can vary from jurisdiction to jurisdiction, and may remain significant.

- The potential hazards associated with LNG transport are considered significant.

- Noise and vibration impacts will be temporary in nature and related solely to construction activities, but could be significant.

- Traffic impacts associated with the construction and operation of catenary overhead electrical lines and fixed guideway systems are potentially significant.

Feasible mitigation measures have been developed for the identified adverse significant impacts; however, those mitigation measures may not reduce the impacts to less than significant. The 2012 AQMP would place only an incremental demand on nonrenewable and limited resources, such as energy and water supplies relative to the rate of use of these resources due to population growth and increased consumer demand. The largely irretrievable conversion of undeveloped/agricultural land to urban uses is a function of the growing population and local land use authority, not the 2012 AQMP. The 2012 AQMP is expected to result in long-term benefits associated with achieving ambient air quality standards and a reduction in the use of petroleum-based fuels (e.g., increased use of alternative fuels).

Conversely, positive environmental changes are expected to result from implementation of the 2012 AQMP. The project will result in significantly reduced emissions of air pollutants, thereby improving air quality and related public health. Emission reductions will also directly improve the vitality of crops and other plants. The health of livestock, domestic animals and other wildlife will be indirectly enhanced by the positive effects on plant life, as well as by any direct benefits attributable to less air pollution. The damage to buildings and other structures attributable to air pollution also will be diminished, as well as an improvement in aesthetics and visibility.

4.10.3 Relationship Between Short-Term Uses and Long-Term Productivity

An important consideration when analyzing the effects of a proposed project is whether it will result in short-term environmental benefits to the detriment of achieving long-term goals or maximizing productivity of these resources. Implementing the 2012 AQMP is not expected to achieve short-term goals at the expense of long-term environmental productivity or goal achievement. The purpose of the 2012 AQMP is to set forth a comprehensive control program that will lead the Basin into compliance with the federal 24-hour PM2.5 air quality standards and achieving additional reductions in ozone precursors. By attaining federal and state air quality standards, the 2012 AQMP is expected to enhance short and long-term environmental productivity in the region.

Implementing the 2012 AQMP does not narrow the range of beneficial uses of the environment. Of the potential environmental impacts discussed in Chapter 4, only those related to air quality impacts associated with construction activities, water demand, noise impacts associated with construction activities and traffic impacts associated with construction activities, are considered potentially significant. Implementation of the recommended mitigation measures will ensure such impacts are mitigated to the greatest degree feasible.

Because no short-term environmental benefits are expected at the expense of long-term environmental goals being achieved, there is no justification for delaying the proposed action. This project must be implemented now as the SCAQMD is required by the Federal and state Clean Air Acts to formally review the 2012 AQMP and adopt relevant plan revisions which will achieve the state and federal ambient air quality standards by the established deadline. The SCAQMD is proceeding with the 2012 AQMP pursuant to this mandate.

4.10.4 Environmental Effects Not Found to Be Significant

The environmental effects of the 2012 AQMP are identified and discussed in detail in the preceding portions of Chapter 4 of this Final Program EIR and in the Initial Study (see Appendix A) per the requirements of the CEQA Guidelines §15128. The following topics of analysis in this Final Program EIR were found to have no potentially significant adverse effects, after mitigation:

- Aesthetic impacts associated with implementation of the control measures in the 2012 AQMP.
- Air quality impacts associated with implementation (operation) of the control measures in the 2012 AQMP.
- Energy impacts associated with implementation of the control measures in the 2012 AQMP.
- Hazards and hazardous materials impacts associated with implementation of the control measures in the 2012 AQMP.
- Hydrology and water quality impacts associated with implementation of the control measures in the 2012 AQMP (other than water demand).

- Land use impacts associated with implementation of the control measures in the 2012 AQMP.
- Noise impacts associated with implementation of the control measures in the 2012 AQMP (other than construction activities).
- Traffic impacts associated with implementation of the control measures in the 2012 AQMP (other than construction activities).
- Solid and hazardous waste impacts associated with implementation of the control measures in the 2012 AQMP.

While all the environmental topics required to be analyzed under CEQA were reviewed to determine if the proposed amendments would create significant impacts, the screening analysis (see Appendix A for the NOP/IS) concluded that the following environmental areas would not be significantly adversely affected by 2012 AQMP: agriculture and forest resources, biological resources, cultural resources, geology and soils, mineral resources, population and housing, public services, and recreation. These topics were not analyzed in further detail in this environmental assessment, however, a brief discussion of each is provided below.

4.10.4.1 Agricultural and Forest Resources Impacts

In general, the 2012 AQMP control measures typically affect existing commercial or industrial facilities, establish specifications for fuels or mobile source exhaust emissions, or accelerate the replacement of high-emitting mobile sources with low emitting mobile sources so they are not expected to generate any new construction of buildings or other structures that would require conversion of farmland to non-agricultural use or conflict with zoning for agricultural uses or a Williamson Act contract. Further, the 2012 AQMP control measures typically affect existing facilities that are located in appropriately zoned areas. Any new facilities that may be affected by the 2012 AQMP control measures would be constructed and operated for reasons other than complying with the 2012 AQMP control measures. For these same reasons, it is not expected that implementing 2012 AQMP control measures will conflict with any forest land zoning codes or convert forest land to non-forest uses. No control measures were identified in the proposed 2012 AQMP that would affect or conflict with existing land use plans, policies, or regulations or require conversion of farmland to non-agricultural uses or forest land to non-forest uses.

Land use, including agricultural- and forest-related uses, and other planning considerations are determined by local governments and no agricultural land use or planning requirements will be altered by the proposed project, except as noted above. The 2012 AQMP control measures, including control measures related to mobile sources, would have no direct or indirect effects on agricultural or forest land resources because these types of control measures typically involve reduction in combustion and fugitive VOC emissions, as well as establishing emission

Based upon the above considerations, significant adverse impacts to agricultural and forestland resources are not expected due to implementation of the 2012 AQMP.

4.10.4.2 Biological Resources Impacts

The effects of implementing the 2012 AQMP control measures typically include reducing mobile source exhaust emissions; modifying fuel specifications; or modifications at existing commercial or industrial facilities to control or further control emissions, which may require some type of construction equipment and activities. Any affected existing commercial or industrial facilities are generally located in appropriately zoned commercial or industrial areas, which typically do not support candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. Typically, existing industrial or commercial facilities are already devoid of plant life or plant life supporting wildlife species for fire safety reasons. Any new industrial or commercial facilities that may be affected by the 2012 AQMP control measures and that have the potential to adversely affect biological resources would be constructed and operated for reasons unrelated to complying with the 2012 AQMP control measures.

Similarly, modifications at existing facilities would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with native or resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites because implementing the 2012 AQMP control measures typically occurs within the boundaries of the affected facilities and, therefore, would not require disturbing wildlife habitat. For these same reasons, since the proposed 2012 AQMP primarily regulates stationary emission sources at existing commercial or industrial facilities, it does not directly or indirectly affect land use policy that may adversely affect riparian habitat or other sensitive natural communities identified in local or regional plans, policies, or regulations, or identified by the California Department of Fish and Game or U.S. Fish and Wildlife Service. It is expected that industrial or commercial facilities that may be affected by 2012 AQMP control measures are already located in appropriately zoned areas or would be located in appropriately zoned areas. The 2012 AQMP control measures do not include any provisions that would allow affected facility operators to violate existing zoning ordinances or regional plans, policies, or regulations. Improving air quality is expected to provide health benefits to plant and animal species in the district. Similarly, the 2012 AQMP contains control measures that establish emission standards for mobile sources or accelerated penetration of low emission vehicles, which could result in additional control of emissions from mobile sources or revision to existing fuel specifications. As a result, the proposed project would not affect land use policies or designations. There are no control measures contained in the 2012 AQMP that would alter this determination.

Implementing some of the 2012 AQMP control measures (e.g., coatings and solvent control measures) could change or increase a facility's potential to generate waste water. Past SCAQMD staff experience with analyzing modifications at industrial or commercial facilities is that they are considered "point sources" and must release wastewater into publicly owned treatment works (POTWs) (e.g., local sewer systems), and, therefore, are subject to National Pollutant Discharge Elimination System (NPDES) permit program administered by the Regional Water Quality Control Board (RWQCB). Direct discharge into federally protected wetlands as defined by §404 of the Clean Water Act would be prohibited under federal law (Clean Water Act) and state law (Porter-Cologne Act) and, therefore, is not expected to occur. Some of the 2012 AQMP control measures have the potential to require air pollution controls at port facilities, which are located on the coast. Port facilities are considered to be heavy industrial facilities (point sources) and the installation of additional controls would be consistent with this land use. Further, any facilities that release wastewater into California's ocean waters are subject to water quality standards established in the California Ocean Plan and are also subject to NPDES requirements, enforced by the local RWQCBs. For all of the above reasons the proposed project will not adversely affect protected wetlands as defined by §404 of the Clean Water Act, including, but not limited to marshes, vernal pools, coastal wetlands, etc., through direct removal, filling, hydrological interruption or other means.

Implementing the proposed 2012 AQMP is not expected to affect land use plans, local policies or ordinances, or regulations protecting biological resources such as a tree preservation policy or ordinance for the reasons given in discussions above, i.e. control measures promulgated as rules or regulations primarily affect existing commercial and industrial facilities through installation of air pollution control equipment, which are typically located in appropriately zoned areas or activities that would accelerate the penetration of low emission vehicles into the regional vehicle fleet. Land use and other planning considerations are determined by local governments and no land use or planning requirements will be altered by the proposed project. Neither SCAQMD nor CARB has legal authority over land use decisions except to impose certain air pollution control requirements, which do not drive the land use approval process, and, therefore, cannot alter or interfere with land use zoning ordinance or designations and cannot approve new land use projects or modifications to existing land use projects. Similarly, the proposed 2012 AQMP is not expected to affect in any way habitat conservation or natural community conservation plans, agricultural resources or operations, and would not create divisions in any existing communities for the reasons discussed above.

Based upon the above considerations, significant adverse impacts to biological resources are not expected due to implementation of the 2012 AQMP.

4.10.4.3 Cultural Resource Impacts

Implementing the proposed 2012 AQMP control measures is primarily expected to result in controlling stationary source emissions at existing commercial or industrial facilities or accelerate the penetration of low emission vehicles into the regional vehicle fleet. Affected facilities where physical modifications may occur are typically located in appropriately zoned commercial or industrial areas that have previously been disturbed and are not typically considered to be historically significant. It is unlikely that construction activities, including heavy construction activities, such as cut-and-fill activities or excavation, at potentially affected existing facilities would uncover cultural resources as these existing facilities are located in previously disturbed areas. Some affected facilities (e.g., refineries) may have equipment older than 50 years that may need to be modified to comply with 2012 AQMP control measures. However, such equipment does not typically meet the criteria identified in CEQA Guidelines §15064.5 (a)(3). Based on these considerations, it is unlikely that implementing control measures in the proposed 2012 AQMP would: adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5, destroy unique paleontological resources or unique geologic features, or disturb human remains interred outside formal cemeteries.

In spite of the fact that most facilities that would be affected by 2012 AQMP control measures are located on previously disturbed sites where there is little likelihood of any remaining identifiable artifacts, it is possible, that implementing control measures could result in construction activities to install pollution control equipment at affected existing facilities that uncover cultural or archaeological resources. Even if this circumstance were to occur, significant adverse cultural resources impacts are not anticipated because there are existing laws in place that are designed to protect and mitigate potential adverse impacts to cultural resources. As with any construction activity, should archaeological resources be found during construction that results from implementing the proposed 2012 AQMP control measures, the activity would cease until a thorough archaeological assessment is conducted as required by state or federal law.

The proposed 2012 AQMP is, therefore, not anticipated to result in any construction activity or promote any programs that could have a significant adverse impact on cultural resources in the district.

4.10.4.4 Geology and Soils Impacts

The proposed 2012 AQMP control measures would not directly or indirectly expose people or structures to earthquake faults, seismic shaking, seismic-related ground failure including liquefaction, landslides, mudslides or substantial soil erosion for the following reasons. In general, the 2012 AQMP control measures affecting mobile sources, such as those that would accelerate the penetration of zero or low emission vehicles into district fleets, would not affect geology or soils because for on-road vehicles, they would continue to operate on existing roadways (ONRD-1, Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles; ONRD-03, Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium-Heavy-Duty Vehicles; etc.). Although some of the 2012 AQMP control measures would accelerate the penetration of zero or low emission off-road equipment, replacing one type of off-road engine with a lower emitting off-road engine would not be expected to affect construction activities. Further, construction activities occur for reasons other than complying with the 2012 AQMP control measures.

When implemented as rules or regulations, the 2012 AQMP control measures regulating stationary sources do not directly or indirectly promote new land use projects that could be located on earthquake faults, seismic zones, etc. Any seismic-related activities in areas where facilities that may be subject to the 2012 AQMP control measures are located would be part of the existing setting. Some minor structural modifications, however, at existing affected facilities may occur as a result of installing control equipment or making process modifications. Such modifications would not likely require large heavy-duty construction equipment or substantial site modifications. In any event, existing affected facilities or modifications to existing facilities would be required to comply with relevant California

Building Code (formerly referred to as the Uniform Building Code) requirements in effect at the time of initial construction or modification of a structure.

Southern California is an area of known seismic activity. Structures must be designed to comply with the California Building Code requirements if they are located in a seismically active area. The local city or county is responsible for ensuring that a proposed project complies with current California Building Code requirements as part of the issuance of the building permits and can conduct inspections to ensure compliance. The California Building Code is considered to be a standard safeguard against major structural failures and loss of life. The goal of the code is to provide structures that will: 1) resist minor earthquakes without damage; 2) resist moderate earthquakes without structural damage but with some non-structural damage; and 3) resist major earthquakes without collapse but with some structural and non-structural damage.

The California Building Code bases seismic design on minimum lateral seismic forces ("ground shaking"). The California Building Code requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes. The basic formulas used for the California Building Code seismic design require determination of the seismic zone and site coefficient, which represent the foundation conditions at the site. Accordingly, buildings and equipment at existing affected facilities are likely to conform to the California Building Code and all other applicable state codes in effect at the time they were constructed.

Any potentially affected facilities that are located in areas where there has been historic occurrence of liquefaction (e.g., coastal zones) or existing conditions indicate a potential for liquefaction, including expansive or unconsolidated granular soils and a high water table, may have the potential for liquefaction-induced impacts at the project sites. The California Building Code requirements consider liquefaction potential and establish more stringent requirements for building foundations in areas potentially subject to liquefaction. Compliance with the California Building Code requirements is expected to minimize the potential impacts associated with liquefaction. The issuance of building permits from the local cities or counties will assure compliance with the California Building Code requirements. Finally, none of the 2012 AQMP control measures require the location of new, or relocation of existing facilities in areas prone to liquefaction. Land use decisions are under the authority of the local jurisdictions, typically cities or counties. Neither the SCAQMD nor CARB has authority over land use decisions except to impose specific air pollution control requirements, which do not drive the land use approval process, and CEQA does not grant an agency new powers independent of the powers granted to the agency by other laws (CEQA Guidelines §15040 (b)).

Because facilities affected by any of the 2012 AQMP control measures are typically located in appropriately zoned areas such as industrial or commercial areas, which are not typically located near known geological hazards (e.g., landslide, mudflow, seiche, tsunami or volcanic hazards), no significant adverse geological impacts are expected. Even if potentially affected facilities are located near such geological hazards, the hazards are part of the existing setting and are not made worse by installing control equipment or other activities to comply with emission control rules and regulations. For example, tsunamis at the Port of Los Angeles and Port of Long Beach, are not expected because the ports are surrounded by breakwaters that protect the area from wave action. In any event, the 2012 AQMP control measures would not increase potential exposures to tsunamis.

Although the proposed 2012 AQMP control measures may require minor modifications at existing industrial or commercial facilities, such modifications are not expected to require substantial grading or construction activities. Typically, existing facilities have already been graded and soil stabilization is already in place (e.g., through the placement of buildings, paving, or other soil stabilization measures currently required pursuant to SCAQMD Rule 403 – Fugitive Dust). In other cases, potentially affected areas may have already been graded or displaced in some way for other reasons (e.g., leveling the site, stabilization of slopes, etc.). Accelerating the penetration of low emission vehicles into the regional vehicle fleet, (ONRD-1, Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles; ONRD-03, Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium-Heavy-Duty Vehicles, etc.), does not require modifications requiring construction activities at existing facilities. Therefore, significant adverse soil erosion impacts are not anticipated from implementing the 2012 AQMP.

Septic tanks or other similar alternative waste water disposal systems are typically associated with small residential projects in remote areas. The proposed 2012 AQMP does not contain any control measures that generate construction of residential or other types of land use projects in remote areas. Neither the SCAQMD nor CARB has land use approval authority. Consequently, construction of small residential land uses with septic systems would occur for reasons other than complying with the 2012 AQMP control measures. Further, the 2012 AQMP control measures typically affect existing industrial or commercial facilities that are already hooked up to appropriate sewerage facilities and are subject to wastewater control requirements, typically through NPDES permits.

Based on these considerations, implementation of the 2012 AQMP is not expected to generate significant adverse geology and soils impacts.

4.10.4.5 Mineral Resources Impacts

There are no provisions of the proposed 2012 AQMP that would directly result in the loss of availability of a known mineral resource of value to the region and the residents of the state, such as aggregate, coal, clay, shale, etc., or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Moreover, the 2012 AQMP is not expected to deplete non-renewable mineral resources in a wasteful manner.

Based upon the above considerations, significant adverse impacts to mineral resources are not expected due to implementation of the 2012 AQMP.

4.10.4.6 Population and Housing Impacts

According to SCAG, current population in the SCAG region (which includes all of the district, the non-district portions of Los Angeles and San Bernardino counties, and all of Ventura and Imperial counties) is approximately 18 million people and is expected to increase by another four million people by 2035. The proposed 2012 AQMP generally affects existing commercial or industrial facilities located in predominantly industrial or commercial urbanized areas throughout the district and, as such, is not anticipated to generate any significant effects, either directly or indirectly, on the district's population or population distribution.

Consistent with past experience, it is expected that the existing labor pool within the southern California area would accommodate the labor requirements for any modifications requiring construction at affected facilities. This is especially true in the current recession. For example, California has a seasonally adjusted unemployment rate of 10.9 percent. Unemployment rates (not seasonally adjusted) in each of the four district counties are as follows: Los Angeles County, 11.5 percent; Orange County, 8.1 percent; Riverside County, 12.8 percent, and San Bernardino County, 12.1 percent.

It is expected that few or no new employees would need to be hired at affected facilities to operate and maintain new control equipment on site because air pollution control equipment is typically not labor intensive equipment. In the event that new employees are hired, it is expected that the existing local labor pool in the district can accommodate any increase in demand for workers that might occur as a result of adopting the proposed 2012 AQMP. Based on the above, it is not expected that the 2012 AQMP would induce population growth resulting in the need for new housing, roads or other infrastructure. As such, adopting the proposed 2012 AQMP is not expected to result in changes in population densities or induce significant growth in population.

In general, the 2012 AQMP control measures affecting mobile sources, such as those that would accelerate the penetration of zero or low emission vehicles into district fleets (e.g., ONRD-1, Accelerated Penetration of Partial Zero-Emission and Zero Emission Vehicles; ONRD-03, Accelerated Penetration of Partial Zero-Emission and Zero Emission Medium-Heavy-Duty Vehicles, etc.), would not induce population growth because there is a finite number of drivers in the region at any one time, so drivers who purchase low or zero emission vehicles would not be driving the old high emitting vehicles at the same time they are driving the new low emitting vehicles. Although projected increases in population in the region may result in the continued use of the replaced high emitting vehicles, as already noted, future population growth in the region would occur for reasons other than complying with the 2012 AQMP control measures.

There are no provisions in any of the 2012 AQMP control measures that would cause displacement of substantial numbers of people or housing necessitating construction of replacement housing elsewhere. As noted in the discussions under "Land Use and Planning, the proposed 2012 AQMP contains control measures that may result in installing control equipment on stationary sources at existing commercial or institutional facilities and establishing emission exhaust specifications for mobile sources. Construction of new structures affecting land use planning would occur for reasons other than complying with the 2012 AQMP control measures. As a result, the proposed 2012 AQMP would not be expected to affect the location of people or housing in any areas of the district.

Based upon the above considerations, significant adverse population and housing impacts are not expect to occur due to implementation of the 2012 AQMP.

4.10.4.7 Public Services Impacts

There is little potential for significant adverse public service impacts as a result of adopting the proposed 2012 AQMP. The 2003 AQMP EIR analyzed potential adverse impacts to public services as a result of implementing the 2003 AQMP control measures and concluded that existing resources at services such as fire departments, police departments and local governments would not be significantly adversely affected as a result of implementing the 2003 AQMP control measures even if there are slight increases in potential flammability impacts from implementing the 2003 AQMP control measures. Similarly, the 2007 NOP/IS concluded that implementing the 2007 AQMP control measures would not significantly adversely affect fire departments, police departments and local governments for the same reasons as identified in the 2003 Program EIR, which include the following considerations. Although implementing the 2012 AQMP control measures may increase the use of alternative clean fuels, for example, there would be a commensurate reduction in currently used petroleum fuels. As first responders to emergency situations, police and fire departments may assist local hazmat teams with containing hazardous materials, putting out fires, and crowd control to reduce public exposures to hazardous materials releases. In many situations, implementing the 2012 AQMP control measures may reduce hazardous materials use (e.g., formulating coatings with less hazardous aqueous formulations). Some of the 2012 AQMP control measures may increase the use of air pollution control equipment that uses hazardous materials. In spite of this, there are no components of any control measures that would result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times or other performance objectives. Further, most large industrial facilities have on-site security that controls public access to facilities so no increase in the need for police services are expected. Many large industrial facilities also have on-site fire protection personnel and/or have agreements for fire protection services with local fire departments. Even in the absence of onsite police or fire protection services, implementing the 2012 AQMP control measures in no way hinders service ratios or response times and is not expected to require physical modifications to existing government facilities to a greater extent than is currently the case. Finally, pursuant to the Health and Safety Code, emergency or rescue vehicles operated by local, state, and federal law enforcement agencies, police and sheriff departments, fire department, hospital, medical or paramedic facility, and used for responding to situations where potential threats to life or property exist, including, but not limited to fire, ambulance calls, or life-saving calls are specifically exempt from regulations requiring alternative clean fueled vehicles. For these reasons, implementing the 2012 AQMP is not expected to require additional fire protection services to an extent that it would cause a need for construction of new facilities.

As indicated in the discussions under Population and Housing, the 2012 AQMP is not anticipated to affect population growth in the district, which would not be expect to adversely affect existing public services or facilities or physically alter, require new public service facilities, or alter the demand for schools. Anticipated development to accommodate future population growth would occur for reasons other than complying with the 2012 AQMP control measures. To address future growth it is the responsibility of local land public agencies with general land use authority, typically cities or counties, over fire departments, police departments and other public services to address potential impacts to public services that may require new or physically altered facilities or affect service ratios, response times, or other performance objectives. Consequently, no significant adverse impacts to schools or parks are foreseen as a result of adopting the proposed 2012 AQMP.

Based upon the above considerations, significant adverse project-specific public services impacts are not expected to occur due to implementation of the 2012 AQMP.

4.10.4.8 Recreation Impacts

As discussed under "Land Use and Planning" and "Population and Housing" above, there are no provisions in the proposed 2012 AQMP that would affect land use plans, policies, ordinances, or regulations. Land use and other planning considerations are determined by local governments. No land use or planning requirements, including those related to recreational facilities, will be altered by the proposal. The proposed project does not have the potential to directly or indirectly induce population growth or redistribution that could adversely affect recreational resources. As a result, the proposed project would not increase the use of, or demand for existing neighborhood and/or regional parks or other recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Based upon the above considerations, no significant adverse project-specific impacts to population and housing are expected to occur due to implementation of the 2012 AQMP.

CHAPTER 5

CUMULATIVE IMPACTS

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Biological Resources
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5.0 CUMULATVE IMPACTS

CEQA Guidelines §15130 (a) requires an EIR to discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in CEQA Guidelines §15065 (a)(3). The 2012 AQMP is a regional plan that includes broad policy criteria and as such, the 2012 AQMP Final Program EIR evaluates the environmental impacts associated with implementing the 2012 AQMP stationary and mobile source control measures to determine whether or not the impacts of the project are cumulatively considerable when combined with potential impacts associated with other similar regional projects involving regulatory activities or other projects with similar impacts.

5.1 INTRODUCTION

The cumulative impacts analysis for the 2012 AQMP Final Program EIR includes the analyses of the SCAQMD's stationary and mobile source control measures and the regulatory activities associated with other measures that could also generate impacts within the Basin. The traffic control measures (TCMs) in the 2012 AQMP (see Appendix IV-C of the ~~Revised Draft~~ 2012 AQMP and Appendix E of this Final Program EIR) were developed and adopted by SCAG as part of the 2012-2035 RTP/SCS[1] and the 2011 Federal Transportation Improvement Program (FTIP) (SCAG 2012).

SCAG's Regional Council approved the TCMs and strategies included in the 2012-2035 RTP/SCS Program EIR and the investment commitments contained in the 2008 RTIP and its subsequent amendments. These measures and recommendations have accordingly been moved forward for inclusion in the region's air quality plans and are included as part of the 2012 AQMP. The impacts of implementation of these TCMs were evaluated in the 2012-2035 RTP/SCS Program EIR (SCAG, 2012). The cumulative analysis in this section of the Final Program EIR for the 2012 AQMP relies primarily on the environmental analyses in the SCAG 2012-2035 RTP/SCS Program EIR for the evaluation of the environmental impacts of implementing the TCMs.

Because the TCMs, their associated mitigation measures[2], and their emissions reductions are included along with the 2012 AQMP in the PM2.5 SIP submittal for the Basin and because the TCMs and other projects in the 2012-2035 RTP/SCS have the potential to generate similar impacts, the 2012-2035 RTP/SCS is considered to be a cumulatively related project. In general, the long-term transportation planning requirements for emission reductions from on-road mobile sources within the district are met by SCAG's RTP/SCS, whereas the short-term implementation requirements of the Transportation Conformity Rule are met by SCAG's biennial Regional Transportation Improvement Program (RTIP) (SCAG 2010).

[1] Under SB 375, SCAG addresses GHG reduction in a Sustainable Communities Strategy (SCS) as part of the Regional Transportation Plan. SB 375 was established to implement the state's GHG emissions reduction goals, as set forth by AB 32, in the sector of cars and light trucks. SCS is intended to provide a vision for future growth in Southern California that would decrease per capita GHG emissions from passenger vehicles.

[2] In addition to summarizing impacts from the 2012-2035 RTP/SCS, this document includes a list of all measures identified in the 2012-2035 RTP/SCS Program EIR to mitigate environmental impacts from that project for informational purposes only. The PEIR for the 2012-2035 RTP/SCS, which includes all of the mitigation measures in Appendix F, was previously certified in April 2012.

In general, TCMs are those control measures 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. Strategies that have a particular bearing on the environment can be grouped into the following components:

- Active Transportation: This strategy integrates land use and transportation by working with sub-regions and local communities to increase development densities and improve the jobs/housing balance. Implementing this strategy encourages walking, biking, and transit use, thereby reducing vehicular demand and environmental impacts.
- Transportation Demand Management (TDM): This strategy reduces vehicular demand and thereby congestion, particularly during peak periods. TDM measures are designed to influence travel behavior and include use of transit, bicycling, and walking, carpools and telecommuting, strategies that allow travelers to easily connect to and from transit service at their origin and destination, vanpool services for larger employers, and rideshare matching services.
- Transportation Systems Management (TSM): This strategy increases the productivity of the existing multi-modal transportation system and relies in part on intelligent transportation system (ITS) technologies such as automated vehicle location (AVL) and advanced monitoring systems, which assist in achieving system efficiencies in ports and intermodal operations, reduce delays and wait times at gates and destinations, and allow for more flexible dispatching, thereby reducing emissions.
- Congestion Management Process (CMP): This strategy manages congestion by requiring that highway capacity projects that significantly increase the capacity for single occupancy vehicles be developed in a comprehensive context that considers all possible alternatives, including transit, TDM and TSM strategies.
- High Occupancy Vehicle (HOV) Gap Closures and Connectors: This strategy builds upon the previous HOV strategy by including additional investments to extend the HOV network, strategically close gaps in the HOV network, convert certain limited access HOV lanes to allow for continuous access, and construct additional direct freeway-to-freeway HOV connectors to maximize the overall system performance by minimizing weaving conflicts and maintaining travel speeds.

The following sections summarize the project-specific and cumulative impacts analyses from the Final Program EIR for the 2012-2035 RTP/SCS. The discussions also summarize project-specific impacts from the 2012 AQMP. The discussions also include an evaluation regarding whether or not impacts from the 2012 AQMP contribute to cumulative impacts from the 2012-2035 RTP/SCS, which have already been evaluated in a Program EIR certified by SCAG.

5.2 AESTHETICS

5.2.1 Cumulative Aesthetic Impacts

Implementation of the 2012 AQMP is not expected to result in potentially significant adverse aesthetic impacts because the 2012 AQMP control measures relate primarily to emission reductions through the incorporation of electrically powered trucks and locomotives. Although, to power this equipment, catenary lines (overhead power lines) could be needed, areas where catenary lines may be constructed would be limited to commercial, industrial areas, along existing transportation corridors, and at existing railyards. The 2012 AQMP Final Program EIR determined that construction and operation of such lines would not substantially degrade the existing visual character of a site or its surroundings, impact existing scenic vistas, or impact any scenic resources, including scenic highways.

According to the 2012-2035 RTP/SCS Program EIR, implementation of the 2012-2035 RTP/SCS would adversely affect aesthetics and views. Expected significant impacts would include the obstruction of scenic views and vista points due to the construction of highways, flyovers, interchanges, goods movement roadway facilities, and sound walls for anticipated RTP/SCS transportation projects, which would potentially block or impede views of mountains, oceans, or rivers. In addition, implementation of the 2012-2035 RTP/SCS would alter areas along state designated scenic highways and vista points, in particular along SR-91 through Riverside and Orange Counties and along SR-14 as part of the High Desert Corridor, connecting Palmdale and the Antelope Valley to Santa Clarita.

Implementing the 2012-2035 RTP/SCS is expected to create significant contrasts with the overall visual character of the existing landscape setting and possibly add urban visual elements to an existing natural, rural, and open space area. In particular, the Gold and Crenshaw Light Rail Lines would travel through urban neighborhoods with distinct character and may be located adjacent to historic resources depending on the final alignments. The wires, structures and other elements associated with light rail would change the character of these areas. Increased urbanization through taller buildings or more compact development could have a similar effect by changing the low-scale nature of a particular neighborhood. Transit centers and park-n-ride lots, constructed primarily within the heavily urbanized portions of the SCAG region, could also affect a large number of viewers.

Implementing the 2012-2035 RTP/SCS would create shade and shadow or light and glare impacts when tall newly constructed elevated transportation infrastructure projects cast a shadow on nearby shadow sensitive areas, such as eating or playing areas. Population growth in the region would also potentially create contrasts with the overall visual character of the existing landscape because some urban land would have increased intensity of use and because currently vacant and undeveloped land would be developed into urban uses.

Because implementation of the 2012-2035 RTP/SCS would include the extension of transportation and related infrastructure to areas outside the region and, as such, would indirectly result in changes to the visual character or to scenic areas outside of the SCAG region, the 2012-2035 RTP/SCS would contribute to a cumulatively considerable loss of scenic resources.

The analysis of potential aesthetics impacts from implementing the 2012 AQMP in Subchapter 4.1 of this Program EIR concluded that the 2012 AQMP would not in itself generate significant adverse aesthetic impacts. Further, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with transportation projects projected in the 2012-2035 RTP/SCS, would not contribute to cumulatively considerable impacts to aesthetic resources identified in the 2012-2035 RTP/SCS because potential aesthetic resources impacts identified in the 2012-2035 RTP/SCS Program EIR are different than the potential aesthetics impacts that could be generated by the 2012 AQMP and, geographically, there is no overlap between the 2012 AQMP projects that may affect aesthetics resources and aesthetic resources impacts created by the 2012-2035 RTP/SCS.

5.2.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse aesthetic impacts. However, because implementation of the 2012-2035 RTP/SCS is expected to generate significant adverse impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.2.3 Level of Impact After Mitigation Measures

Potential aesthetics resources impacts from the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation as the population growth projected by 2035 in combination with projects identified in the 2012-2035 RTP/SCS would consume currently vacant land that would create significant contrasts with the overall visual character of the existing landscape setting. Moreover, the 2012 AQMP would not contribute to that impact as noted in Subsection 5.2.1, so adverse cumulative operational aesthetics resources impacts are concluded to be less than significant.

5.3 AGRICULTURAL RESOURCES

5.3.1 Cumulative Agricultural Resources Impacts

Impacts to agricultural resources were considered and fully evaluated in the August 2, 2012 Notice of Preparation/Initial Study (8/2/12 NOP/IS) prepared for the 2012 AQMP. As concluded in the 8/2/12 NOP/IS, implementation of the 2012 AQMP is not expected to result in significant adverse impacts to the agriculture resource because the 2012 AQMP control measures typically affect existing commercial or industrial facilities or establish specifications for fuels or mobile source exhaust emissions and as such are not expected to generate new construction of buildings or other structures that would require conversion of farmland to non-agricultural use or conflict with zoning for agricultural uses. No comment letters were received by the SCAQMD during the 8/2/12 NOP/IS comment period disputing this conclusion.

Agricultural resources were considered under the combined category of Land Use and Agricultural Resources section in the 2012-2035 RTP/SCS Program EIR[3]. According to the 2012-2035 RTP/SCS Program EIR, implementing the proposed 2012-2035RTP/SCS transportation projects would result in substantial disturbance and/or loss of prime farmlands or grazing lands throughout southern California. Furthermore, development of highway, arterial, and transit projects proposed under the 2012-2035 RTP/SCS would result in the disturbance and/or loss of a substantial portion of these designated agricultural areas. The 2012-2035 RTP/SCS specifically calls out highway expansion and potential connector projects such as the High Desert Corridor project, the mixed flow Express/High Occupancy Toll (HOT) lane project along SR-395, as well as roadway improvements, toll road improvements and connections, grade separated facilities for bus ways, goods movement roadway facilities, and HOV/HOT connectors as projects which could result in significant impacts to agricultural lands.

In total, the 2012 RTP/SCS would result in approximately 74,300 total new lane miles by 2035, some of which would potentially disturb or consume agricultural lands in the region. The loss and disturbance of agricultural land was concluded to be a significant impact of the 2012-2035 RTP/SCS Program EIR.

Impacts to agricultural resources were determined to be below the level of significance in the 8/2/12 NOP/IS. Furthermore, when combined with past, present, and reasonably foreseeable activities, and in particular with projects identified as part of the 2012-2035 RTP/SCS, the 2012-2035 RTP/SCS would not contribute to a cumulatively considerable impact to agricultural resources requiring mitigation.

5.3.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse agricultural impacts and does not contribute to the impacts identified in the 2012-2035 RTP/SCS Final Program EIR. However, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.3.3 Level of Impact After Mitigation Measures

Potential agricultural resources impacts associated with the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of the 2012-2035 RTP/SCS would contribute to significant loss and disturbance of agricultural lands. Moreover, the 2012 AQMP would not

[3] The topic of forestry resources was not evaluated in the Final Program EIR for the 2012-2035 RTP/SCS.

contribute to these impacts as noted in Subsection 5.3.1, so adverse cumulative operational agricultural resources impacts are concluded to be less than significant.

5.4 AIR QUALITY

5.4.1 Cumulative Air Quality Impacts

Construction Impacts: Implementation of the 2012 AQMP is expected to result in potentially significant adverse air quality impacts associated with: 1) additional infrastructure to support electric and alternative fuel vehicles; 2) additional infrastructure for stationary source controls; and, 3) additional infrastructure to support electrification of new sources.

According to the 2012-2035 RTP/SCS Program EIR, implementation of the 2012-2035 RTP/SCS transportation projects would result in substantial construction activities. The construction activities would create short-term temporary emissions from the following activities: 1) demolition; 2) site preparation operations (e.g., grading/excavation); 3) fuel combustion from the operation of construction equipment; 4) delivery and hauling of construction materials and supplies to and from sites; 5) the use of asphalt or other oil based substances during the final construction phases of projects; and, 6) travel by construction workers to and from sites.

Construction activities associated with the 2012 AQMP would result in significant impacts to the air quality resource and any concurrent emissions-generating activities from reasonably foreseeable construction activities would add an additional air emission burden to these significant levels. Therefore, construction air quality impacts from the 2012 AQMP are considered to be cumulatively considerable prior to mitigation and would contribute to significant adverse cumulative impacts from the 2012-2035 RTP/SCS.

Operational Impacts - Criteria Pollutants: The 2012 AQMP is expected to result in an emission reduction in NOx, VOC, SOx, and PM emissions, providing an air quality benefit. As shown in Figure 4.2-3, the 2012 AQMP is expected to attain the 24-hour federal PM2.5 standard by 2014. The 2012 AQMP also is expected to: 1) implement specific measures to implement Clean Air Action Section 182 (e)(5) to assist in attaining the eight-hour ozone standard by 2023; 2) maintain compliance with state and federal NO2 standards (even considering the increase in population growth); 3) maintain compliance with state and federal SO2 standards (even considering the increase in population growth); and, 4) maintain compliance with the federal 24-hour average PM10 standard.

Control measures from the 2012 AQMP are expected to increase the demand for electrical energy associated with operation of add-on control equipment, electrical support facilities for on-road vehicles and off-road vehicles, and shore-side electricity associated with "cold ironing" of marine vessels. While these control measures may cause an increase in emissions from power plants used in electricity production, overall emissions in the Basin would be reduced because combustion emissions from natural gas, used to produce electricity, are lower than combustion emissions from gasoline or diesel engines. The 2012 AQMP Final Program EIR concluded that overall the net emissions effects from implementing 2012 AQMP control measures would be a reduction and that no significant adverse impacts to air quality are expected from 2012 AQMP control measures requiring increased demand for electricity or natural gas.

The 2012 AQMP control measures associated with control of stationary sources are expected to result in a small increase in CO and NOx emissions. However, the 2012 AQMP would achieve enough NOx reductions overall to maintain ambient air quality standards. Also, although a potential exists for secondary particulate formation from ammonia slip, in selective catalytic reduction (SCR) applications used to control NOx emissions from stationary sources, the 2012 AQMP Final Program EIR concluded that no new or substantially more severe significant air quality impacts related to ammonia emissions and secondary particulate formation from the increased use of SCR systems is expected.

Several 2012 AQMP control measures would reduce VOC emissions by reformulating or specifying utilization of certain VOC-containing products. The 2012 AQMP Final Program EIR concluded that air quality impacts from implementing future coatings rules would result in an overall reduction of VOC emissions and would be beneficial to air quality.

Control measures in the 2012 AQMP would also reduce emissions from mobile sources by accelerating the penetration of partial zero-emission and zero emission vehicles and off-road equipment, accelerating the replacement of old locomotive engines, increasing the amount of shore-side marine power, accelerating the replacement of aircraft engines with cleaner burning engines, increasing the use of alternative fuels, and increasing the use of add-on control devices. The 2012 AQMP Final Program EIR concluded that estimated VOC, CO, NOx, SOx, PM10, and PM2.5 emissions associated with on-road mobile sources in the district are expected to be reduced and that the overall impact of mobile source control measures is expected to be a beneficial impact on air quality. Finally, several 2012 AQMP control measures would regulate a variety of different types of emissions sources including both area and point sources. These control measures are expected to reduce VOC, criteria pollutant, and precursor emissions.

Under the 2012-2035 RTP/SCS, mobile source criteria pollutant emissions would stay approximately the same or decrease, providing an air quality benefit. However, the increase of re-entrained roadway dust would increase proportionately to vehicle miles traveled (VMT) and as such was considered a significant impact in the 2012-2035 RTP/SCS Program EIR.

Implementation of the 2012 AQMP would not in itself result in significant air quality impacts associated with operational activities. For this reason, the 2012 AQMP would not be expected to contribute to significant adverse cumulative impacts from transportation projects projected in the 2012-2035 RTP/SCS.

Operational Impacts - Non-Criteria Pollutants: Several 2012 AQMP control measures may result in the increased use of ammonia in SCRs. However, because ammonia slip from SCR units is restricted to 5.0 ppm or less, which has been shown through source-specific permit modeling to have no significant impact on surrounding communities, the impact from the use of ammonia as proposed in the 2012 AQMP is expected to be less than significant.

The 2012 AQMP is expected to result in a reduction of toxic air contaminant (TAC) emissions. The basis for this conclusion is that many TACs are also classified as criteria pollutants (e.g., PM and VOCs). To the extent that the 2012 AQMP control measures reduce PM and VOC emissions, associated TAC emission reductions could occur as well. The overall impacts associated with implementation of the 2012 AQMP are an overall reduction in non-criteria pollutants (e.g., toxic air contaminants). Therefore, no significant impacts on non-criteria pollutants have been identified.

Under the 2012-2035 RTP/SCS, as a result of on-going emission controls, cancer and other health risks within any given distance of mobile sources in the region would decline, although the health risks adjacent to transportation facilities would remain higher than regional averages and above desirable levels. As a result of 2012-2035 RTP/SCS policies anticipated growth patterns would concentrate population adjacent to transit and other transportation facilities in High Quality Transit Areas (HQTAs) that could result in more people being exposed to elevated cancer risk as compared to areas of the region more distant from such facilities. Therefore under the 2012-2035 RTP/SCS more sensitive receptors would be located adjacent to transportation facilities and would therefore be exposed to transportation-related air toxics. In addition, although non-carcinogenic health impacts due to VMT-related re-entrained dust would increase, these health impacts would be at least partially offset by the decrease in health impacts related to the decrease of air toxics and criteria pollutants from vehicle exhaust.

Implementation of the 2012 AQMP would not in itself result in significant air quality impacts associated with non-criteria pollutants. Moreover, the 2012 AQMP would not contribute to impacts associated with transportation projects projected in the 2012-2035 RTP/SCS and, therefore, would not be expected to contribute to a cumulatively considerable impact requiring mitigation.

Greenhouse Gas Impacts: The 2012 AQMP is expected to result in a reduction of GHGs. This conclusion is based on the fact that mobile source control measures would reduce GHG emissions through accelerated penetration of partial zero-emission and zero emission vehicles, the use of alternative fuels such as natural gas, the combustion of which generates less GHG emissions than diesel fuel.

The proposed 2012 AQMP control measures and the recommended state and federal control measures that promote fuel and energy efficiency and pollution prevention would also reduce GHG emissions. Measures that stimulate the development and use of new technologies would also be beneficial. In general, strategies that conserve energy, promote clean technologies, and result in a reduction in vehicle miles traveled would reduce GHG emissions. Therefore, the cumulative impacts are expected to result in an overall reduction in GHGs.

According to the 2012-2035 RTP/SCS Program EIR, implementation of the 2012-2035 RTP/SCS projects would result in a significant increase of greenhouse gas emissions from residential and commercial building construction, operational energy demand, and total mobile source emissions. The 2012-2035 RTP/SCS Program EIR concludes that implementation of 2012-2035 RTP/SCS projects would meet the applicable AB 32 reduction targets (identified in SB 375) with respect to light duty vehicles. However, without technical details as to how each sector of the economy would comply with AB 32, growth anticipated to occur under the 2012-2035 RTP/SCS could result in a significant impact related to AB 32 and the Scoping Plan.

The 2012-2035 RTP/SCS Program EIR concluded that because per capita carbon dioxide emissions from light duty trucks and autos would meet ARB targets by 2020 and would achieve even greater emission reductions in 2035, the 2012-2035 RTP/SCS would result in a less-than-significant impact related to per capita emissions and SB 375.

5.4.2 Mitigation Measures

The 2012 AQMP is expected to result in significant adverse air quality impacts associated with construction activities. Mitigation measures AQ-1 through AQ-8 would serve to reduce those impacts, but significant impacts would remain for CO and PM10.

The 2012 AQMP Final Program EIR concluded that implementation of 2012 AQMP control measures would not generate significant adverse secondary operational air quality impacts from increased electricity and natural gas demand or from control of stationary sources. The 2012 AQMP Final Program EIR also concluded that the implementation of 2012 AQMP control measures would result in beneficial air quality impacts associated with coating or consumer product regulations, with mobile sources, and with miscellaneous source control measures, by providing emission reductions. Therefore, no significant adverse air quality impacts associated with operational control measures are expected and no mitigation measures are required.

It was also concluded that the 2012 AQMP would not generate significant adverse secondary air quality impacts from non-criteria pollutants. The 2012 AQMP also concluded that implementation of 2012 AQMP control measures would not result in significant air quality impacts from GHG emissions. Therefore, no mitigation is required.

Because implementation of the 2012-2035 RTP/SCS would result in significant air quality impacts associated with construction, health impacts associated with re-entrained roadway dust due to VMT increase, health impacts associated with the location of a potentially greater number of people adjacent to transportation facilities, and an increase in GHG emissions, mitigation measures were imposed in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures would also reduce impacts associated with the 2012 AQMP and are included in Appendix F of the 2012 AQMP Final Program EIR.

5.4.3 Level of Significance After Mitigation Measures

The air quality impacts associated with 2012 AQMP control measures were determined to be significant for construction activities and less than significant for secondary emissions from increased electricity demand, control of stationary sources, change in use of lower VOC materials, mobile sources, increase use of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone. Although mitigation measures identified in the 2012 AQMP Final Program EIR would reduce construction air quality impacts associated with construction activities, impacts would remain significant and as such would continue to contribute to considerable impacts following mitigation.

Similarly, although mitigation measures identified in the 2012-2035 RTP/SCS Program EIR would reduce air quality and associated health impacts, impacts for construction, operation, TACs, and GHG impacts would continue to contribute to cumulatively considerable impacts following mitigation. Moreover, the 2012 AQMP would not contribute to these impacts as noted in Subsection 5.4.1, so adverse cumulative operational air quality impacts are concluded to be less than significant.

5.5 BIOLOGICAL RESOURCES

5.5.1 Cumulative Biological Resources and Open Space Impacts

Impacts to biological resources were considered and fully evaluated in the 8/2/12 NOP/IS prepared for the 2012 AQMP. As determined in the 8/2/12 NOP/IS, implementation of the 2012 AQMP would not adversely affect plant and/or animal species in the Basin because the 2012AQMP control measures typically affect existing commercial or industrial facilities or establish specifications for fuels or mobile source exhaust emissions. Such existing commercial or industrial facilities are generally located in appropriately zoned commercial or industrial areas, which typically do not support candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. No comment letters were received during the 8/2/12 NOP/IS that disputed this conclusion.

According to the 2012-2035 RTP/SCS Program EIR, implementation of the 2012-2035 RTP/SCS would adversely affect biological resources and open space. Expected significant adverse impacts would include disturbance and removal of natural vegetation that may be utilized by sensitive species, habitat fragmentation and the associated decrease in habitat quality, litter, smoke, light pollution and road noise in previously undisturbed natural areas, trampling of natural vegetation, displacement of riparian and wetland habitat, as well as long-term impacts such as stream siltation of streams and other water bodies during construction and operation.

The amount of new urbanized acreage (consuming previously vacant land) would be on the order of hundreds of thousands of acres. Despite the inability to predict the acreage of each habitat type that may be affected, it is reasonable to expect that this future urban development would contribute to the same types of impacts detailed previously above. These indirect impacts on biological resources are associated with population, employment, and household growth forecasted by SCAG. Transportation projects included in the 2012-2035 RTP/SCS on previously undisturbed land would potentially displace natural vegetation and, thus, habitat, some of which is utilized by sensitive species in the region. In particular, the 2012-2035 RTP/SCS Program EIR states that the Mixed Flow Improvement along Highway 395 and the High Quality Transit Area (HQTA) along the I-15 in Riverside County would be located in sensitive and listed animal species habitat could result in a direct loss of habitat. In addition, because implementation of 2012-2035 RTP/SCS projects would cause loss of habitat as well as habitat fragmentation in habitat corridors that cross the SCAG region's boundaries, thereby limiting the movement of wildlife species beyond the SCAG region, the 2012-2035 RTP/SCS Program EIR determined that implementation of the 2012-2035 RTP/SCS would contribute to a cumulative biological resources impact.

Implementation of the 2012 AQMP would not in itself result in significant biological impacts. Moreover, the 2012 AQMP would not contribute to impacts associated with transportation projects projected in the 2012-2035 RTP/SCS and, therefore, would not be expected to contribute to a cumulatively considerable impact requiring mitigation.

5.5.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse biological impacts. However, because implementation of the 2012-2035 RTP/SCS would result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.5.3 Level of Impact After Mitigation Measures

2012-2035 RTP/SCS impacts associated with biological and open space resources would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation due to significant disturbance and removal of natural vegetation that may be utilized by sensitive species, habitat fragmentation and the associated decrease in habitat quality, litter, trampling, light pollution and road noise in previously undisturbed natural areas, displacement of riparian and wetland habitat, siltation of streams and other water bodies during construction, and the loss of prime farmlands, grazing lands, open space and recreation lands. The increased urban development anticipated by the 2012-2035 RTP/SCS would also result in similar impacts. However, since the 2012 AQMP was not identified as creating any adverse biological resources impacts, it would not create cumulatively considerable impacts, so adverse cumulative biological resources impacts from the 2012 AQMP are concluded to be less than significant.

5.6 CULTURAL RESOURCES

5.6.1 Cumulative Cultural Resources Impacts

Impacts to cultural resources were considered and fully evaluated in the 8/2/12 NOP/IS prepared for the 2012 AQMP. As determined in the 8/2/12 NOP/IS, implementation of the 2012 AQMP would not adversely affect cultural resources because the 2012 AQMP control measures typically affect existing commercial or industrial facilities or establish specifications for fuels or mobile source exhaust emissions. Potentially affected facilities would not require extensive cut-and-fill activities or excavation at undeveloped sites, and implementation of the 2012 AQMP would therefore not adversely affect historical or archaeological resources as defined in CEQA Guidelines §15064.5, destroy unique paleontological resources or unique geologic features, or disturb human remains interred outside formal cemeteries. No comment letters were received by the SCAQMD during the 8/2/12 NOP/IS comment period disputing this conclusion.

In a small number of cases, implementation of the 2012 AQMP may require minor site preparation and grading at an affected facility. Under this circumstance, it is possible that archaeological or paleontological resources could be uncovered. Even if this circumstance were to occur, significant adverse cultural resources impacts are not anticipated because construction activities would occur at previously disturbed industrial or commercial locations and there are existing laws in place that are designed to protect and mitigate potential adverse impacts to cultural resources. As with any construction activity, should archaeological resources be found during construction that result from implementation of the 2012 AQMP, the activity would cease until a thorough archaeological assessment is conducted and the Native American Heritage Commission (NAHC) is contacted, if necessary.

According to the 2012-2035 RTP/SCS Program EIR, as of August 2011, over 68,000 archaeological and over 1,200 historic locations have been identified in the SCAG region. Each of these sites is documented at the Office of Historic Preservation, which holds location information on archaeological sites for each region in California. Paleontological sites are also numerous in southern California. The development of new transportation facilities as part of the 2012-2035 RTP/SCS may affect historical resources because many HQTAs would be located in older urban centers where structures of architectural or historical significance are likely to be located. In addition, 2012-2035 RTP/SCS transportation projects would significantly affect archaeological and paleontological resources because the projects could be located in previously undisturbed areas.

Furthermore, since it is not always possible to predict where human remains may occur outside of formal burials, it is possible that excavation and construction activities associated with 2012-2035 RTP/SCS projects may disturb previously undiscovered human remains not interred in marked, formal burials, resulting in significant impacts.

Finally, the 2012-2035 RTP/SCS's influence on growth would contribute to regional impacts on existing and previously undisturbed and undiscovered cultural resources; impacts would combine with impacts in other areas of Southern California to contribute to a cumulative loss of cultural resources in California.

Implementation of the 2012 AQMP would not in itself result in significant impacts to cultural resources. However, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with increased urbanization, projected in the 2012-2035 RTP/SCS, would not be expected to contribute to cumulatively considerable impacts to existing historic resources and previously undisturbed and undiscovered archeological and paleontological resources requiring mitigation.

5.6.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts to cultural resources. However, because implementation of the 2012-2035 RTP/SCS would result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.6.3 Level of Impact After Mitigation Measures

Potential impacts from the 2012-2035 RTP/SCS associated with cultural resources would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts to cultural resources would remain significant following mitigation because the 2012-2035 RTP/SCS is expected to affect a potentially large number of historic properties, archaeological resources, and paleontological resources. Moreover, the 2012 AQMP would not contribute to impacts associated with transportation projects projected in the 2012-2035 RTP/SCS and, therefore, would not be expected to contribute to a cumulatively considerable impact requiring mitigation. As a result, adverse cumulative cultural resources impacts from the 2012 AQMP are concluded to be less than significant.

5.7 ENERGY

5.7.1 Cumulative Energy Impacts

Implementation of the 2012 AQMP is expected to result in an overall increase in electricity demand. While this increase is expected to be within the electric generating capacity of the region, an increase in electricity of greater than one percent represents a substantial increase in electricity use. Similarly, the increased demand for natural gas for both stationary source and mobile source control measures were concluded to be significant, even though since sufficient natural gas resources are available. Thus, the energy impacts associated with electricity and natural gas demand from the implementation of the 2012 AQMP are considered to be significant.

Implementation of the 2012 AQMP is expected to result in less than significant energy impacts for use of petroleum fuels, use of alternative fuels (e.g., hydrogen), and on renewable energy sources. Furthermore, implementation of the 2012 AQMP control measures would result in a demand reduction of petroleum fuels. Finally, although implementation of the 2012 AQMP control measures would increase hydrogen demand as a transportation fuel, this increase is not expected to be significant since hydrogen is not widely available, its use is currently limited, and future demand is expected be met through increased production. The energy impacts associated with the future use of hydrogen is expected to be less than the current strategy that uses predominately petroleum based fuels such that no significant hydrogen demand impacts are expected. Further, control measures may have a renewable energy benefit from the use of solar energy.

Energy resources are considered as part of the 2012-2035 RTP/SCS Program EIR Public Services and Utilities section. According to the 2012-2035 RTP/SCS Program EIR, implementation of the 2012-2035 RTP/SCS may uncover and potentially sever underground utility lines during construction activities, prior to mitigation.

The 2012-2035 RTP/SCS Program EIR concluded that implementation of the 2012-2035 RTP/SCS would increase energy demand associated with construction of regional transportation system and anticipated development. The RTP/SCS Program EIR also concluded that the 2012-2035 RTP/SCS would result in less transportation fuel consumption due to RTP/SCS' emphasis on compact land use and growth patterns that facilitate transit and non-motorized transportation. The 2012-2035 RTP/SCS Program EIR also identified that overall population growth, accommodated by the transportation investments, would require an increase in energy resources and as such would result in significant impacts to non-renewable energy resources. Finally, the 2012-2035 RTP/SCS Program EIR concluded that the anticipated demand for energy would contribute to depleting energy reserves and as such would contribute to a cumulatively significant impact.

Implementation of the 2012 AQMP was concluded to generate significant impacts to electricity and natural gas energy supplies. The 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with construction activities and accommodated population growth demands predicted by the 2012-2035 RTP/SCS Program EIR, may contribute to cumulatively considerable impacts electricity and natural gas energy impacts. Moreover, the 2012 AQMP would not contribute to impacts associated with demand for petroleum fuels, alternative fuels or non-renewable energy supplies requiring mitigation.

5.7.2 Mitigation Measures

The 2012 AQMP is expected to result in significant electricity demand impacts associated with electrification of stationary and mobile sources. Mitigation measures E-1 through E-7 would serve to reduce impacts from increased electricity demand and mitigation measures E-8 through E-12 would reduce impacts from increased demand for natural gas. In spite of implementing these mitigation measures, significant adverse energy impacts would remain.

The 2012 AQMP Final Program EIR also concluded that impacts would be less than significant for use of petroleum fuels, use of alternative fuels (e.g., hydrogen), and use of renewable energy sources.

Implementation of the 2012-2035 RTP/SCS would result in significant impacts from construction projects associated with urban development and growth accommodated by the 2012-2035 RTP/SCS transportation projects, therefore, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. Energy resources were addressed as part of the Public Services and Utilities section of the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.7.3 Level of Impact after Mitigation Measures

Electricity and natural gas demand impacts associated with the 2012 AQMP control measures were concluded to be significant, while energy impacts associated with use of petroleum fuels, use of alternative fuels and renewable energy sources were considered to be less than significant. Although mitigation measures identified in the 2012 AQMP Final Program EIR would reduce energy impacts associated with electricity demand, impacts would remain significant and as such would continue to contribute to considerable impacts following mitigation.

2012-2035 RTP/SCS impacts associated with energy resources would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because energy consumed during construction and expansion of the transportation system, as well as growth that would be accommodated by the 2012-2035 RTP/SCS, would contribute to considerable impacts following mitigation. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would contribute to a cumulatively considerable electricity and natural gas demand impacts following mitigation.

5.8 GEOLOGY AND SOILS

5.8.1 Cumulative Geology and Soils Impacts

Impacts to geologic resources were considered and fully evaluated in the 8/2/12 NOP/IS prepared for the 2012 AQMP. As determined in the 8/2/12 NOP/IS, implementation of the 2012 AQMP would not directly or indirectly expose people or structures to earthquake faults, seismic shaking, seismic-related ground failure including liquefaction, landslides, mudslides or substantial soil erosion; no new structures would be constructed as the result of implementing the 2012 AQMP. Although some structural modifications at existing affected facilities may occur as a result of installing control equipment or making process modifications, existing affected facilities or modifications to existing facilities would be required to comply with relevant California Building Code requirements in effect at the time of initial construction or modification of a structure which are expected to mitigate geology and soils impacts to less than significant. No comment letters were received disputing these conclusions.

Geology and soils were considered in the 2012-2035 RTP/SCS Program EIR as part of the Geology, Soils and Mineral Resources section. All of southern California is susceptible to impacts from seismic activity and numerous active faults are known to exist in the region that could potentially generate seismic events capable of significantly affecting transportation facilities proposed in the 2012-2035 RTP/SCS. According to the 2012-2035 RTP/SCS Program EIR, seismic events could damage transportation infrastructure through surface rupture, ground shaking, liquefaction, and landsliding. Specifically, implementation of the new light rail transit (LRT) routes/extension in Los Angeles and San Bernardino Counties, new highways, arterials, bus rapid transit routes, goods movement (freight), heavy and light rail routes, high-speed trains, and other capacity enhancements proposed under the

2012-2035 RTP/SCS would be susceptible to impacts from seismic activity. Although seismic activity could cause damage to existing substandard construction, new designs taking account of current engineering knowledge can significantly reduce potential damage and harm. Earthquake-resistant designs employed on new structures minimize the impact to public safety from seismic events. The 2012-2035 RTP/SCS Program EIR also determined that seismically induced tsunami and seiche waves could damage transportation infrastructure proximate to coastal areas, but that the potential for these impacts would be remote and was not considered significant.

The 2012-2035 RTP/SCS Program EIR concluded that earthwork associated with implementation of the 2012-2035 RTP/SCS could result in soil erosion and/or loss of topsoil and in some cases could result in slope failure. The 2012-2035 RTP/SCS Program EIR further determined that location of 2012-2035 RTP/SCS projects on expansive soils and unstable geologic units could have potentially significant impacts to property and public safety due to on- or off-site landslides, lateral spreading, subsidence, liquefaction or collapse. Finally, the 2012-2035 RTP/SCS Program EIR concluded that implementation of the 2012-2035 RTP/SCS would occur within the SCAG region, would be site-specific in nature and as such would not contribute to a cumulatively considerable increase in risk associated with geologic hazards.

Impacts under geologic and soil resources were determined to be below the level of significance in the 8/2/12 NOP/IS, therefore, when combined with past, present, and reasonably foreseeable activities, and in particular with projects identified as part of the 2012-2035 RTP/SCS, would not be expected to contribute to a cumulatively considerable geologic and soil resources impacts prior to mitigations.

5.8.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts under geologic and soil resources. However, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.8.3 Level of Impact After Mitigation Measures

Potential geologic and soil resources impacts associated with the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of the 2012-2035 RTP/SCS is expected to result in potential damage to transportation infrastructure through surface rupture, ground shaking, liquefaction, and landsliding, as well as long term soil erosion and/or loss of top soil, subsidence, and slope failure. Moreover, the 2012 AQMP would not contribute to geologic and soil resources impacts associated with transportation projects projected in the 2012-2035 RTP/SCS and, therefore, would not be expected to contribute to a cumulatively considerable impact requiring mitigation.

5.9 HAZARDS AND HAZARDOUS MATERIALS

5.9.1 Cumulative Hazards and Hazardous Materials Impacts

Implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts from hazards and hazardous materials associated with the use of alternative fuels or the use of fuel additives. Fire hazards associated with reformulated coatings, adhesives, solvents, lubricants, mold release products, and other consumer products are potentially significant. The hazard impacts associated with alternative fuels, except for the transport of LNG are considered less than significant. Hazard impacts associated with the transport of LNG are considered potentially significant. In addition, the hazards associated with a spill of ammonia (used as a catalyst in SCR systems) were determined to be potentially significant. Finally, the hazard impacts associated with facility shutdown and start up operations and associated with the use of catalysts were considered less than significant.

According to the 2012-2035 RTP/SCS Program EIR, proposed freight rail enhancements and other goods movement capacity enhancements could result in increased or new transport of hazardous materials or wastes. In addition, construction and maintenance of such projects would result in use of equipment that contains or uses routine hazardous materials (e.g., diesel-fuel, paint and cleaning solutions), and the transportation of excavated soil and/or groundwater containing contaminants from previously contaminated areas. The 2012-2035 RTP/SCS Program EIR concludes that although individual projects would be required to comply with all existing regulations, due to the volume of projects (transportation and development) contained within the RTP/SCS it is possible that significant impacts could occur.

Because implementing the 2012-2035 RTP/SCS would facilitate the movement of goods, including hazardous materials, through the region, transportation of goods, in general, and hazardous materials in particular, is expected to increase substantially with implementation of the 2012-2035 RTP/SCS. The 2012-2035 RTP/SCS Program EIR estimated that daily regional heavy duty truck VMT within the SCAG region would increase from 41 million in 2011 to 65 million in 2035, a 58 percent increase. The 2012-2035 RTP/SCS Program EIR concluded that there would be a potential to create a hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment during transportation. The 2012-2035 RTP/SCS Program EIR also concluded that approximately 541 existing kindergarten through 12th grade schools would be located within a one-quarter mile buffer of the 2012-2035 RTP/SCS projects and as such could be impacted by an accidental release of hazardous materials.

Furthermore, according to the 2012-2035 RTP/SCS Program EIR, implementation of the 2012-2035 RTP/SCS would potentially disturb contaminated property during the construction of new transportation or expansion of existing transportation facilities and disturb contaminated sites as a result of population, housing and employment growth in the region. Finally, the 2012-2035 RTP/SCS Program EIR concluded that the forecasted urban development and growth that would occur under the 2012-2035 RTP/SCS and the increased mobility provided by the 2012-2035 RTP/SCS would result in increased hazardous materials transport outside of the SCAG region and as such would contribute to cumulatively considerable impacts.

Implementation of the 2012 AQMP would result in significant impacts from fire hazards associated with reformulated products, the possibility of ammonia tank failures, and from transport of LNG. The 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with transportation projects projected in the 2012-2035 RTP/SCS, would contribute to cumulatively considerable impacts prior to mitigation.

5.9.2 Mitigation Measures

In the 2012 AQMP, mitigation measures HZ1 and HZ2 were developed to minimize fire impacts associated with reformulated products. HZ3 through HZ6 were developed to minimize impacts associated with LNG transport, and HZ7 through HZ10 were development to minimize impacts associated with ammonia storage. Implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.9.3 Level of Impact After Mitigation Measures

It was concluded in the 2012 Program EIR that potentially significant adverse fire hazard impacts associated with reformulated products and the on-site ammonia storage hazards would be less than significant after mitigation. In spite of implementing mitigation measures, it was concluded that hazards associated with LNG transport would remain significant.

It was concluded in the 2012-2035 RTP/SCS that impacts associated with hazards and hazardous materials would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, impacts from the implementation of the 2012-2035 RTP/SCS, associated with upset and accident conditions, hazardous emissions in vicinity of schools, and disturbance of contaminated property during construction activities would remain significant following mitigation. When combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, the 2012 AQMP has the potential to contribute to a cumulatively considerable hazards and hazardous materials impacts following mitigation for the risks associated with the transport of LNG.

5.10 HYDROLOGY AND WATER QUALITY

5.10.1 Cumulative Hydrology and Water Quality Impacts

Implementation of 2012 AQMP control measures may result in impacts to water quality and increased wastewater discharge associated with the use of alternative fuels, increased use of batteries, increased water demand, use and application of sodium bisulfate for livestock operations, and use of ammonia in SCR applications.

The 2012 AQMP Final Program EIR concluded that wastewater treatment facilities would have sufficient capacity to handle the estimated increase in wastewater that could be generated from reformulation of products and use of air pollution control equipment. The 2012 AQMP Final Program EIR also concluded that the use of alternative fuels would not result in greater adverse water quality impacts than the use of conventional fuels. In addition, the 2012 AQMP Final Program EIR concluded that the recycling of EV and hybrid batteries would be greater than lead-acid batteries in conventional vehicles, reducing the potential for illegal disposal and potential water quality impacts. Furthermore, the 2012 AQMP Final Program EIR concluded that the use and application of sodium bisulfate in livestock operations would be controlled and monitored to prevent water quality runoff and related water quality impacts. The 2012 AQMP Final Program EIR also concluded that potential spills associated with ammonia would be contained on-site via required secondary spill containment devices and berms. Finally, the 2012 AQMP Final Program EIR concluded that water demand associated with the manufacture and use of waterborne and add-on air pollution control technologies would be potentially significant.

According to the 2012-2035 RTP/SCS Program EIR, project-specific studies would be necessary to determine the actual potential for significant impacts on water resources resulting from implementation of the 2012-2035 RTP/SCS. However, general program-level impacts from new transportation projects proposed in the 2012-2035 RTP/SCS would degrade local surface water quality by increased roadway and urban runoff, potentially violating water quality standards associated with wastewater and stormwater permits. In addition, the 2012-2035 RTP/SCS could alter the existing drainage patterns in ways that would result in substantial erosion or siltation.

Implementation of the 2012-2035 RTP/SCS would also increase impervious surfaces due to additional miles of roadway, in addition to urban development associated with the population distribution by 2035, and as such would increase runoff and potentially affect groundwater recharge rates. Furthermore, the 2012-2035 RTP/SCS would potentially increase flooding hazards by placing structures such as transportation investments on alluvial fans and within 100-year flood hazard areas and increase the rate or amount of surface runoff in a manner that would result in flooding or produce or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems.

The 2012-2035 RTP/SCS Program EIR concluded that although wastewater rates are expected to increase 21 percent by 2035, population growth would be dispersed throughout the SCAG region and, especially given aggressive water conservation strategies, the SCAG region would not outgrow its wastewater treatment capacity by the year 2035.

The 2012-2035 RTP/SCS Program EIR also concluded that increased mobility and inclusion of land-use-transportation measures would influence the pattern of urbanization in southern California and although most water agencies have plans in place to respond to future growth, the existing water supplies and infrastructure would not be sufficient to meet the expected demand in 2035. Finally, the 2012-2035 RTP/SCS Program EIR concluded that any increase in water demand in the SCAG regions would affect areas outside the region by consuming water that could be used in other areas and that due to uncertainties associated with water supply management, this would contribute to a cumulatively considerable impact prior to mitigation.

Implementation of the 2012 AQMP would result in significant adverse water demand impacts associated with the manufacture and use of waterborne and add-on air pollution control technologies. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and with 2012-2035 RTP/SCS would contribute to cumulatively considerable impacts prior to mitigation.

5.10.2 Mitigation Measures

The 2012 AQMP Final Program EIR identifies possible mitigation measures to reduce water demand associated with the manufacture and use of waterborne and add-on air pollution control technologies. The 2012 AQMP Final Program EIR concludes that while mitigation measures are available, they can vary from jurisdiction to jurisdiction, and impacts may remain significant. In addition, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.10.3 Level of Impact After Mitigation Measures

Although 2012 AQMP impacts associated with water demand would be reduced following the implementation measures, the effectiveness of mitigation measures can vary between jurisdictions, therefore, water demand impacts may remain significant.

2012-2035 RTP/SCS impacts associated with hydrology and water quality would be reduced following the implementation of the 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation for water quality, wastewater, riparian habitats and waters of the U.S. runoff/drainage, groundwater, flooding, and water supply. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would contribute to cumulatively considerable impacts following mitigation to water demand impacts. The cumulative impacts of other hydrology and water quality impacts associated with the 2012 AQMP are less than significant.

5.11 LAND USE AND PLANNING

5.11.1 Cumulative Land Use and Planning Impacts

Implementation of the 2012 AQMP is not expected to result in potentially significant adverse land use impacts because the 2012 AQMP would for the most part impose control requirements on stationary sources at existing commercial or institutional facilities, establish emission exhaust specifications for mobile sources, and control emissions from mobile sources. Although some 2012 AQMP control measures may require the construction of battery charging or fueling infrastructure as well as construction of catenary lines, the 2012

AQMP Final Program EIR concluded that impacts associated with these activities would not generate significant adverse land use impacts because they would be developed within or adjacent to existing roadways and transportation corridors.

It should be noted that there are no provisions of the 2012 AQMP that would directly affect land use plans, policies, or regulations. The SCAQMD is specifically precluded from infringing on existing city or county land use authority (California Health & Safety Code §40414). Land use and other planning considerations are determined by local governments and no present or planned land uses in the region or planning requirements would be altered by the 2012 AQMP.

Land use and planning were considered under the combined category of Land Use and Agricultural Resources section in the 2012-2035 RTP/SCS Program EIR. According to the 2012-2035 RTP/SCS Program EIR, implementation of the 2012-2035 RTP/SCS would result in inconsistencies with general plans, disruption or division of established communities, changes to land uses by changing concentrations of development throughout SCAG, change patterns of growth and urbanization beyond the SCAG region, and cumulatively considerable changes to land use and the intensity of land use. Short-term construction related impacts and long-term or permanent displacement or offsite impacts from new facilities would potentially occur as a result of implementation of the 2012-2035 RTP/SCS.

Implementation of the 2012 AQMP control measures would not conflict with applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, or physically divide an established community. Therefore, when combined with past, present, and reasonably foreseeable activities, and in particular with projects identified as part of the 2012-2035 RTP/SCS, it would not contribute to cumulatively considerable impacts requiring mitigation.

5.11.2 Mitigation Measures

Land use and planning mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts to land use and planning. However, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. Land use and planning resources were combined with agricultural resources in the 2012-2035 RTP/SCS. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.11.3 Level of Impact After Mitigation Measures

Potential land use and planning impacts associated with the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of the 2012-2035 RTP/SCS would contribute to inconsistencies with general plans, disruption or division of established communities, changes to land uses by changing concentrations of development throughout SCAG, change patterns of growth and urbanization beyond the SCAG region, and cumulatively considerable changes to land use and the intensity of land use. Short-term construction related impacts and long-term or permanent displacement or offsite impacts from new facilities would also potentially occur as a result of implementation of the 2012-2035 RTP/SCS. Moreover, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would not be expected to contribute to cumulatively considerable land use and planning impacts requiring mitigation.

5.12 MINERAL RESOURCES

5.12.1 Cumulative Mineral Resources Impacts

Impacts to mineral resources were considered and fully evaluated in the 8/2/12 NOP/IS, prepared for the 2012 AQMP. As determined in the 8/2/12 NOP/IS, implementation of the 2012 AQMP would not directly or indirectly impact mineral resources. No comment letters were received by the SCAQMD during the 8/2/12 NOP/IS disputed this conclusion.

Mineral resources were considered under the combined category of Geology, Soils and Mineral Resources in the 2012-2035 RTP/SCS Program EIR. According to the 2012-2035 RTP/SCS Program EIR, implementing the proposed 2012-2035 RTP/SCS transportation projects would result in the loss of availability of known aggregate and mineral resources that would be of value to the region.

Since potential impacts to mineral resources were determined to be below the level of significance in the 8/2/12 NOP/IS, when combined with past, present, and reasonably foreseeable activities, and in particular with projects identified as part of the 2012-2035 RTP/SCS, the 2012 AQMP is not expected to contribute to cumulatively considerable impacts to mineral resources prior to mitigation.

5.12.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts to mineral resources. However, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. Mineral resources were combined in the 2012-2035 RTP/SCS with geology and soil resources. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.12.3 Level of Impact After Mitigation Measures

Potential impacts from the 2012-2035 RTP/SCS associated with mineral resources would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of 2012-2035 RTP/SCS would result in increased demand driven by growth and the large number of projects anticipated in the 2012-2035 RTP/SCS. Moreover, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities and in particular with the 2012-2035 RTP/SCS transportation projects, would not be expected to contribute to cumulatively considerable mineral resources impacts requiring mitigation.

5.13 NOISE

5.13.1 Cumulative Noise Impacts

Construction Impacts: Implementation of the 2012 AQMP control measures associated with air pollution control technologies and exhaust standards would not result in noise and vibration impacts because construction activities would occur within appropriately zoned industrial and commercial areas, impacts would be temporary and limited to construction activities, and construction noise/vibration impacts to sensitive receptors would not be expected. However, implementation of the 2012 AQMP control measures associated with construction of overhead catenary lines could result in significant noise and vibration impacts due to the geographic proximity of sensitive receptors.

According to the 2012-2035 RTP/SCS Program EIR, grading and construction activities associated with the proposed freeway, arterial, transit, and rail projects, as well as anticipated development would intermittently and temporarily generate noise and vibration levels above ambient background levels. Noise and vibration levels in the immediate vicinity of the construction sites would increase substantially sometimes for extended duration, resulting in temporary noise increases at nearby sensitive receptors, creating potentially significant adverse noise impacts.

Operational Impacts: Implementation of the 2012 AQMP control measures is not expected to result in significant adverse operational noise impacts because the 2012 AQMP control measures typically affect existing commercial or industrial facilities typically located in appropriately zoned industrial or commercial areas. It is not expected that modifications to install air pollution control equipment would substantially increase ambient noise levels in the area, either permanently or intermittently, or expose people to excessive noise levels that would be noticeable above and beyond existing ambient levels. Although overhead catenary lines could be installed to comply with certain control measures, these lines would be installed along existing roadways and transportation corridors and as such would not result in the construction of new roadways or corridors.

According to the 2012-2035 RTP/SCS Program EIR, noise-sensitive land uses could be exposed to operational noise in excess of normally acceptable noise levels and could experience substantial increases in noise as a result of:

- The operation of expanded or new transportation facilities (e.g., increased traffic resulting from new highways, addition of highway lanes, roadways, ramps, and use of new transit facilities as well as increased use of existing transit facilities, etc.).
- Increased vehicle activity (e.g., autos, trucks, buses, planes, trains, etc.) associated with development and resulting in increased ambient noise next to transportation facilities.

Implementation of 2012 AQMP control measures could result in significance noise and vibration impacts during construction activities. Therefore, when combined with past, present, and reasonably foreseeable activities, and in particular with the increased development projected in the 2012-2035 RTP/SCS, the 2012 AQMP would contribute to cumulatively considerable noise impacts prior to mitigation.

5.13.2 Mitigation Measures

Mitigation measures NO-1 through NO-9 in the 2012 AQMP Final Program EIR would reduce noise impacts associated with construction of overhead catenary lines. Furthermore, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.13.3 Level of Impact After Mitigation Measures

Although impacts would be reduced following implementation of noise mitigation measures identified in the 2012 AQMP Final Program EIR, noise and vibration impacts associated with the construction of catenary lines would remain significant in areas where sensitive receptors are located near transportation corridors.

2012-2035 RTP/SCS impacts associated with noise would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation for noise and vibration during construction activities and operational activities. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would contribute to cumulatively considerable noise and vibration impacts following mitigation.

5.14 POPULATION AND HOUSING

5.14.1 Cumulative Population, Housing and Employment Impacts

Impacts to population and housing were considered and fully evaluated in the 8/2/12 NOP/IS prepared for the 2012 AQMP. As determined in the 8/2/12 NOP/IS, implementation of the 2012 AQMP is not expected to result in significant adverse population and housing impacts because the 2012 AQMP control measures typically affect existing commercial or industrial facilities located in predominantly industrial or commercial urbanized areas. It is expected that the existing labor pool within the areas surrounding any affected facilities would accommodate the labor requirements for any facility or equipment modifications. In addition, it is not expected that affected facilities would be required to hire additional personnel to operate and maintain new control equipment on site because air pollution control equipment is typically not labor intensive equipment. In the event that new employees are hired, it is expected that the existing local labor pool in the district can accommodate any increase in demand for workers that might occur as a result of adopting the proposed 2012 AQMP. Therefore, implementing 2012

AQMP control measures is not expected to result in changes in population densities or induce significant growth in population. No comment letters were received by the SCAQMD during the 8/2/12 NOP/IS comment period disputing this conclusion.

According to the 2012-2035 RTP/SCS Program EIR, implementing the 2012-2035 RTP/SCS would induce population growth in some areas of the SCAG region, displace existing homes and businesses, and influence the pattern of growth in the regions through transportation investments and land use strategies.

Since population, housing and employment impacts were concluded to be below the level of significance in the 8/2/12 NOP/IS, when combined with past, present, and reasonably foreseeable activities, and in particular with the anticipated impacts in the 2012-2035 RTP/SCS, the 2012 AQMP would not be expected to contribute to cumulatively considerable impacts to population and housing prior to mitigation.

5.14.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts to population, housing, and employment. However, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F of the 2012 AQMP Final Program EIR.

5.14.3 Level of Impact After Mitigation Measures

Potential population, housing, and employment impacts associated with the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, although the policies included in the 2012-2035 RTP/SCS seek to direct growth in a way that is efficient for both mobility and land consumption, 2012-2035 RTP/SCS population, housing, and employment impacts would remain significant following mitigation because implementation of the 2012-2035 RTP/SCS would continue to induce growth to certain areas of the region. In addition, although 2012-2035 RTP/SCS Program EIR mitigation measures would serve to reduce potential impacts related to displacement of residences and businesses, a substantial number of businesses and residences would likely be displaced due to development associated with 2012-2035 RTP/SCS projects. The accessibility afforded by the 2012-2035 RTP/SCS and the expected shifts in population, households, and employment associated with the mobility benefits would change the growth patterns in the region, generating potentially significant adverse cumulative population and housing impacts in spite of implementing mitigation measures. Moreover, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and with 2012-2035 RTP/SCS projects in particular, would not be expected to produce cumulatively considerable impacts requiring mitigation.

5.15 PUBLIC SERVICES

5.15.1 Cumulative Public Services Impacts

Impacts to public services were considered and fully evaluated in the 8/2/12 NOP/IS prepared for the 2012 AQMP. As determined in the 8/2/12 NOP/IS, implementation of the 2012 AQMP would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times or other performance objectives. Most industrial facilities have on-site security that control public access to facilities and therefore, an increase in the need for police services is not expected. Furthermore, most industrial facilities have on-site fire protection personnel and/or have agreements for fire protection services with local fire departments. For these reasons, implementing the 2012 AQMP is not expected to require additional fire or police protection services. In addition, implementation of the 2012 AQMP is not expected to induce population growth and as such would not increase or otherwise alter the demand for schools and parks in the district. Therefore, no significant adverse impacts to schools or parks are foreseen as a result of adopting the proposed 2012 AQMP. No comment letters were received that disputed this conclusion.

According to the 2012-2035 RTP/SCS Program EIR, implementing the 2012-2035 RTP/SCS would adversely affect public services and utilities. Expected significant impacts would include demand for more police, fire, and emergency personnel and facilities, demand for more school facilities and teachers, and increase in the number of houses in areas subject to wildfires. The 2012-2035 RTP/SCS concluded that impacts to fire services would contribute to regionally cumulatively considerable impacts to staffing levels and response times of police, fire and emergency services.

Construction necessary to implement the 2012-2035 RTP/SCS could potentially uncover and sever underground utility lines (electric and natural gas), as could any groundbreaking in the SCAG region. For this reason, the project implementation agency is normally required to incorporate the locations of existing utility lines into the construction schedule prior to construction. Per the 2012-2035 RTP/SCS Program EIR, prior knowledge and avoidance during construction of existing utility lines would reduce this impact.

Because impacts to public services and utilities were determined to be below the level of significance in the 8/2/12 NOP/IS, when combined with past, present, and reasonably foreseeable activities, and in particular with the anticipated impacts in the 2012-2035 RTP/SCS, the 2012 AQMP is not expected to contribute to cumulatively considerable impacts to public services requiring mitigation.

5.15.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts to public services and utilities. However, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-

2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F of the 2012 AQMP Final Program EIR.

5.15.3 Level of Impact After Mitigation Measures

Potential adverse impacts to public services and utilities from the 2012-2035 RTP/SCS would be reduced following the implementation of the 2012-2035 RTP/SCS Program EIR mitigation measures. However, public service impacts from the 2012-2035 RTP/SCS associated with police, fire, and emergency response were concluded to be significant in spite of implementing mitigation measures. Impacts to wildfire threats would also remain significant because development would occur in areas that have a high threat of fire.

The region's demand to accommodate an additional 453,000 school children would remain a significant impact on public services following implementation of 2012-2035 RTP/SCS mitigation measures. The 2012-2035 RTP/SCS Program EIR also concluded that impacts to underground utility lines would be reduced to below the level of significance following mitigation.

Based on the above information, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and with 2012-2035 RTP/SCS projects in particular, is not expected to produce cumulatively considerable impacts to public services and utilities requiring mitigation.

5.16 RECREATION

5.16.1 Cumulative Recreational Resources Impacts

Impacts to recreational resources were considered and fully evaluated in the 8/2/12 NOP/IS prepared for the 2012 AQMP. As discussed in the 8/2/12 NOP/IS, and similar to the conclusions regarding potential land use and planning impacts, there are no provisions in the proposed 2012 AQMP that would affect land use plans, policies, ordinances, or regulations related to recreation facilities or services. Recreation-related land use and other planning considerations are determined by local governments and no land use or planning requirements, including those related to recreational facilities, would be altered by the proposal. The proposed project would not have the potential to directly or indirectly induce population growth or redistribution that could adversely affect recreational resources. As a result, the proposed project would not increase the use of, or demand for existing neighborhood and/or regional parks or other recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. No comment letters were received by the SCAQMD during the 8/2/12 NOP/IS comment period disputing this conclusion.

Impacts to recreational resources were considered under the combined category of Public Services and Utilities section in the 2012-2035 RTP/SCS Program EIR. According to the 2012-2035 RTP/SCS Program EIR, implementing the proposed 2012-2035 RTP/SCS projects would result in a substantial loss or disturbance of existing open space and recreational lands, as well as a potential to increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial deterioration of the facilities would occur. The 2012-2035 RTP/SCS Program EIR concluded that implementation of 2012-2035 RTP/SCS projects would result in significant impacts prior to mitigation.

Because potential impacts to recreational resources were determined to be below the level of significance in the 8/2/12 NOP/IS, when combined with past, present, and reasonably foreseeable activities, and in particular with projects identified as part of the 2012-2035 RTP/SCS, the 2012 AQMP would not be expected to contribute to a cumulatively considerable impact to recreational resources requiring mitigation.

5.16.2 Mitigation Measures

Recreation mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts to recreational resources. However, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. Recreational resources were considered as part of the Public Services and Utilities section of the 2012-2035 RTP/SCS. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.16.3 Level of Impact After Mitigation Measures

Potential impacts associated with recreational resources from the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because implementation of the 2012-2035 RTP/SCS would contribute to loss and disturbance of open space and recreational lands. Based on the information above, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would not be expected to contribute to cumulatively considerable recreation impacts following mitigation.

5.17 SOLID AND HAZARDOUS WASTE

5.17.1 Cumulative Solid and Hazardous Waste Impacts

Implementation 2012 AQMP control measures would not significantly increase disposal of spent batteries, activated carbon, filters, and catalysts, and the early retirement of older equipment and replacement with newer and lower emission technology equipment, would not generate significant additional waste.

The 2012 AQMP Final Program EIR concluded that because spent batteries are required to be and are largely recycled, the increased use of EVs and hybrid vehicles would not result in a significant increase in the illegal disposal of batteries. In addition, solid waste impacts due to 2012 AQMP air pollution control technologies would not be significant because spent carbon and catalysts are usually recycled and reused rather than disposed in landfills and filter waste would be small because the amount of material collected is small. The 2012 AQMP Final Program EIR concludes that control measures that would require new equipment can require that retirement occurs as the life of the old equipment is exhausted and new equipment is put into service. For equipment that may be retired before the end of its useful life, that equipment may be reused in areas outside the district. Equipment with no remaining useful life is expected to be recycled for metal content. Therefore, no significant solid/hazardous waste impacts were identified due to implementation of the control measures.

Impacts from solid waste were considered under the combined category of Public Services and Utilities section in the 2012-2035 RTP/SCS Program EIR, whereas impacts from hazardous waste were considered under the Hazardous Materials section in the 2012-2035 RTP/SCS Program EIR. According to the 2012-2035 RTP/SCS Program EIR, implementing the proposed 2012-2035 RTP/SCS projects would result in a significant amount of solid waste generated during construction of new transit lines, truck lanes, HOV connectors, and HOT projects through grading and excavation activities, as well as debris resulting from removal of structures. Construction of urban development would be expected to generate similar debris. Construction debris would be recycled or used as fill at other projects or transported to the nearest landfill site and disposed of appropriately. The 2012-2035 RTP/SCS Program EIR concluded that implementation of 2012-2035 RTP/SCS projects would result in significant impacts prior to mitigation. Impacts associated with hazardous waste, as identified by the 2012-2035 RTP/SCS Program EIR, are consistent with and are presented in Section 5.9, Hazards and Hazardous Materials of that document.

The 2012-2035 RTP/SCS Program EIR also concluded that because 2012-2035 RTP/SCS projects may require transport of waste to less urban areas of the region or outside of the region, to landfills that are less impacted than local landfills, implementation of 2012-2035 RTP/SCS projects would result in a cumulatively considerable demand on solid waste facilities that exceeds regional capacity.

5.17.2 Mitigation Measures

Mitigation measures are not required for the 2012 AQMP because implementation of the 2012 AQMP is not expected to result in potentially significant adverse impacts due to solid and hazardous wastes. However, because implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.17.3 Level of Impact After Mitigation Measures

Potential impacts associated with solid and hazardous waste from the 2012-2035 RTP/SCS would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, 2012-2035 RTP/SCS impacts would remain significant following mitigation because the demand for solid waste services in the SCAG region and the resulting need to move solid waste large distances, potentially out of the region, would remain. Based on the above information, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with the 2012-2035 RTP/SCS transportation projects, would not be expected to contribute to cumulatively considerable solid or hazardous waste impacts requiring mitigation.

5.18 TRANSPORTATION AND TRAFFIC

5.18.1 Cumulative Transportation and Traffic Impacts

Implementation of the 2012 AQMP is not expected to result in potentially significant adverse transportation and traffic impacts because the 2012 AQMP control measures typically affect existing commercial or industrial facilities or establish specifications for fuels or mobile source exhaust emissions and as such are not expected to generate new construction or substantially increase vehicle trips or vehicle miles traveled in the district. However, some 2012 AQMP control measures could necessitate the construction of overhead catenary lines, within or adjacent to existing roadways, streets, freeways, and/or transportation corridors. Such construction activities would generate traffic associated with construction worker vehicles and trucks delivering equipment, materials and supplies to the project site during the duration of the construction activities. Construction activities, including potential lane closures, were considered to be significant.

Similarly, transportation infrastructure improvements pertaining to overhead catenary electrical lines could require the dedication of an existing lane exclusive to vehicles using the overhead catenary electrical lines or fixed guideway systems. The dedication of an existing lane would mean that other vehicles would have reduced access to available driving lanes. Thus, a reduction in the number of available lanes on a roadway to accommodate vehicles using the overhead catenary electrical lines could adversely affect traffic and congestion for all other vehicles on the road, significant adverse operational traffic impacts are anticipated to be generated by the 2012 AQMP because no new streets, roads, freeways, or rail lines would be required and the 2012 AQMP control measures would apply to existing transportation corridors.

The 2012 AQMP relies on transportation and related control measures developed by SCAG in the 2012-2035 RTP/SCS. These transportation control measures include strategies to enhance mobility by reducing congestion through transportation infrastructure improvements, mass transit improvements, increasing telecommunications products and services, enhanced bicycle and pedestrian facilities, etc. Specific strategies that serve to reduce vehicle trips and vehicle miles traveled, such as strategies resulting in greater reliance on mass transit, ridesharing, telecommunications, etc., are expected to result in reducing traffic congestion. Although population in the district would continue to increase, implementing the transportation control measures (in conjunction with the RTP) would ultimately result in greater percentages of the population using transportation modes other than single occupant vehicles. As a result, relative to population growth, existing traffic loads and the level of service designation for intersections district-wide would not be expected to decline at current rates due to implementing the 2012 AQMP. Implementing the 2012 AQMP would not hinder population growth in the district, however, could hinder transportation/traffic improvements and congestion reduction benefits of the 2012-2035 RTP/SCS.

According to the 2012-2035 RTP/SCS Program EIR, implementation of the 2012-2035 RTP/SCS would result in several significant and several less than significant impacts as follows:

- Vehicle Miles Traveled (VMT) - Substantial growth and development is anticipated to occur within the region between 2011 and 2035. Based on SCAG's modeling results, average daily VMT are expected to grow from 448 million miles in 2011 to 517 million miles per day in 2035; constituting a 13 percent increase over this period and includes light-, medium- and heavy-duty vehicle VMT in all six counties. While the 2012-2035 RTP/SCS's multimodal strategies aim to reduce per capita VMT over the next 25 years, total demand to move people and goods would continue to grow due to the region's population increase. The 2012-2035 RTP/SCS, therefore, targets transportation systems that have room to grow, including transit, high-speed rail, active transportation, express lanes, and goods movement. Although per capita VMT would decrease, the environment would experience an overall increase in VMT and would be significant prior to mitigation.
- Vehicle Hours of Delay (VHD) - Average vehicle hours of delay would be reduced from 3,277,000 vehicle-hours in 2011 to 3,115,000 vehicle-hours in 2035, and as such would constitute a less than significant impact.
- Vehicle Hours of Delay for Heavy-Duty Trucks - The transportation system is heavily influenced by goods movement, particularly by heavy-duty trucks. Despite regional planning efforts to improve the efficiency of goods movement, increased demand for goods would lead to an increase from 117,000 to 158,000 average daily heavy-duty truck vehicle hours of delay by 2035 and as such would constitute a significant impact.
- Peak Period Work Trips - In 2035, with the implementation of the 2012-2035 RTP/SCS, 82 percent of the evening peak period work trips would take 45 minutes or less by single occupancy vehicle, 77 percent of the evening peak period work trips would take 45 minutes or less by high occupancy vehicle, and 21 percent would occur within 45 minutes by transit. There would be an increase in the percent of work opportunities within 45 minutes travel time by personal vehicle as compared to the current condition. The transit percentage would remain approximately the same. This result is considered to be a regional benefit; the 2012-2035 RTP/SCS would result in a less-than-significant impact related to work commute.
- System-Wide Fatality and Injury - Implementation of the 2012-2035 RTP/SCS would contribute to a lower system-wide fatality accident rate and injury rate for all travel modes in 2035 compared to the existing condition. The system-wide daily fatality rate would be 0.17 fatalities per million persons for all travel modes, a decrease of 0.03 daily fatalities per million persons when compared to the existing rate of 0.20. The system-wide daily injury rate would be 12.92 injuries per million persons for all travel modes, a decrease of 5.34 daily injuries per million persons when compared to the existing rate of 18.27. The reductions in fatality and injury rates would be beneficial and would constitute less than significant impacts.

- 2012-2035 RTP/SCS Program EIR Cumulative Impact - Implementation of the 2012-2035 RTP/SCS would contribute to a cumulatively considerable amount of transportation impacts, such as VMT and all-vehicle vehicle hours in delay, to counties outside of the SCAG region. As the population increases through 2035, the number of trips originating and ending in Santa Barbara, San Diego and Kern counties to and from the SCAG region would increase. The transportation demand from growth, in combination with the projects in the 2012-2035 RTP/SCS would contribute to a cumulatively considerable transportation impact in these other counties.

Implementation of the 2012 AQMP would significantly adversely affect traffic and circulation during construction of overhead catenary lines and during operation if the roadways are dedicated to low or zero emission trucks. The 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and in particular with projects identified as part of the 2012-2035 RTP/SCS, would contribute to cumulatively considerable impacts prior to mitigation.

5.18.2 Mitigation Measures

Mitigation measure TT-1 in the 2012 AQMP would reduce traffic and circulation impacts associated with construction of catenary lines. No mitigation measures were identified that could reduce potentially significant adverse impacts from operating roadways with catenary lines. Since implementation of the 2012-2035 RTP/SCS is expected to result in significant impacts, mitigation measures were identified in the 2012-2035 RTP/SCS Program EIR. The 2012-2035 RTP/SCS Program EIR mitigation measures are included in Appendix F, as part of the 2012 AQMP Final Program EIR.

5.18.3 Level of Impact After Mitigation Measures

Potential construction traffic and circulation impacts from the 2012 AQMP would be reduced following the implementation of TT-1, however because it may not be possible to reduce construction traffic impacts to less than significant under all conditions, the 2012 AQMP Final Program EIR concluded that construction impacts on traffic would remain significant.

Impacts to transportation and traffic would be reduced following the implementation of 2012-2035 RTP/SCS Program EIR mitigation measures. However, the 2035 VMT and 2035 heavy-duty truck VHD would be substantially greater than the existing conditions and as such would result in a significant impact in spite of implementing mitigation measures. In addition, as population increases through 2035, the number of trips originating and ending in Santa Barbara, San Diego and Kern counties to and from the SCAG region would increase. The transportation demand from growth, in combination with the accommodating projects in the 2012-2035 RTP/SCS would contribute to a cumulatively considerable transportation impact in these counties. Therefore, the 2012 AQMP, when combined with past, present, and reasonably foreseeable activities, and with 2012-2035 RTP/SCS projects in particular, would contribute to cumulatively considerable construction impacts following mitigation and, since no mitigation measures were identified that reduce potential operation-related traffic impacts, these remain significant.

CHAPTER 6

ALTERNATIVES

Introduction

Methodology for Developing Project Alternatives

Alternatives Rejected as Infeasible

Alternatives to the 2012 AQMP

Alternatives Analysis

Comparison of the Project Alternatives to the 2012 AQMP

Environmentally Superior and Lowest Toxic Alternative

Conclusion

6.1 INTRODUCTION

This Final Program EIR provides a discussion of alternatives to the proposed project as required by CEQA. Pursuant to the CEQA Guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project but would avoid or substantially lessen any of the significant effects of the project, and provide means for evaluating the comparative merits of each alternative (CEQA Guidelines §15126.6 (a)). In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines §15126.6 (a)). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation. An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (CEQA Guidelines §15126.6 (f)(3)).

6.2 METHODOLOGY FOR DEVELOPING PROJECT ALTERNATIVES

The alternatives typically included in CEQA documents for proposed SCAQMD rules, regulations, or plans are developed by breaking down the project into distinct components (e.g., emission limits, compliance dates, applicability, exemptions, pollutant control strategies, etc.) and varying the specifics of one or more of the components. Different compliance approaches that generally achieve the objectives of the project may also be considered as project alternatives.

The overall control strategy for the 2012 AQMP is designed to meet applicable federal and state requirements, including attainment of ambient air quality standards. The focus of the 2012 AQMP is to demonstrate attainment of the 2006 24-hour PM2.5 national ambient air quality standard by the 2014 attainment date, as well as provide an update regarding ozone to ensure further implementation of measures [Clean Air Act §182 (e)(5)] to meet the federal and state 8-hour ozone standards. Therefore, 2012 AQMP serves as the official SIP submittal for the federal 2006 24-hour PM2.5 standard, for which U.S. EPA has established a due date of December 14, 2012. The 2012 AQMP includes a number of short-term stationary source control measures and §182 (e)(5) stationary and mobile sources, both on-road and off-road, control measures. The attainment demonstration for the new 8-hour ozone standard (75 ppb) will be addressed in a 2015 ozone plan.

The possible alternatives to the proposed 2012 AQMP are limited by the nature of the project. For example, the SCAQMD is required to prepare a PM2.5 AQMP that demonstrates attainment of the federal PM2.5 federal ambient air quality standard by 2014. To achieve the 2006 24-hour PM2.5 ambient air quality standard by 2014, the 2012 AQMP relies on a comprehensive and integrated control approach. Further, 2012 AQMP control measures are developed to achieve the maximum emission reduction potential that is technically feasible and cost-effective. Because, the 2012 AQMP includes all feasible control measures identified as part of the AQMP development process and control measures reflect the maximum emission reduction potential, it is difficult to develop alternatives that would still achieve the project objectives, including attaining the federal 24-hour PM2.5 standard, but are substantially different than the 2012 AQMP.

In spite of the limitations identified above with regard to developing project alternatives, similar to previous AQMP Program EIRs, alternatives to the 2012 AQMP focus on emphasizing different pollutant control strategies. For example, alternatives could rely more heavily on emission reductions from short-term stationary source control measures versus greater reliance on future §182 (e)(5) mobile source control measures. Ultimately, all project alternatives must demonstrated attainment of the federal 24-hour PM2.5 standard.

The shortest routes for attaining the federal 24-hour PM2.5 typically rely on controlling directly emitted PM2.5 or controlling PM2.5 precursor pollutants, especially NOx because it also contributes to the SCAQMD's efforts to attain the federal ozone standards. Some combination of strategies to control both PM2.5 and NOx is necessary because neither a PM2.5-heavy control approach nor a NOx-heavy control approach can attain the standards alone.

Development of the PM2.5 attainment control strategy relies on baseline emissions specified by the emissions inventory of all emissions sources in the district. As indicated in Subchapter 3-1 of this Final Program EIR, the federal CAA §172 (c)(3) requires all plan (AQMP) submittals to include a comprehensive, accurate, and current inventory of actual emissions from all sources of the relevant pollutant(s). To fulfill the intent of this requirement, the year 2008 was selected as the baseline year for analyzing the effectiveness of 2012 AQMP control measures in attaining the PM2.5 standard. Consistent with CAA §172 (c)(3) requirements, the baseline year for alternatives to the 2012 AQMP will also be year 2008.

Typically, the existing setting is established at the time the NOP/IS is circulated for public review, which was June 2012. This baseline is used for all environmental topics analyzed in this Final Program EIR except air quality. However, CEQA Guidelines §15125 (a) recognizes that a baseline may be established at times other than when the NOP/IS is circulated to the public by stating (emphasis added), "This environmental setting ***will normally*** constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." Therefore, consistent with CAA §172 (c)(3) requirements, the air quality baseline for the 2012 AQMP is the year 2008.

6.3 ALTERNATIVES REJECTED AS INFEASIBLE

In accordance with CEQA Guidelines §15126.6 (c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Section 15126.6 (c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: 1) failure to meet most of the basic project objectives; 2) infeasibility; or, 3) inability to avoid significant environmental impacts.

As noted in Section 6.2, the range of feasible alternatives to the 2012 AQMP is limited by the nature of the proposed project and associated legal requirements. Similarly, the range of alternatives considered, but rejected as infeasible is also relatively limited. The following subsections identify two potential alternatives to the 2012 AQMP, but were rejected for the reasons explained in each subsection.

6.3.1 No Project Alternative – No Further Action

CEQA documents typically assume that the adoption of a no project alternative would result in no further action on the part of the project proponent or lead agency. For example, in the case of a proposed land use project such as a housing development, adopting the No Project Alternative terminates further consideration of that housing development or any housing development alternative identified in the associated CEQA document. In that case, the existing setting would typically remain unchanged.

The concept of taking no further action (and thereby leaving the existing setting intact) by adopting a No Project Alternative does not readily apply to an update of an already adopted and legally mandated plan such as the AQMP. Adopting a no project alternative for an update to the AQMP does not imply that no further action will be taken (e.g., halting implementation of the existing AQMP). The federal and state Clean Air Acts require the SCAQMD to revise and implement the AQMP in order to attain all state and national ambient air quality standards. A no further action no project alternative in the case of the AQMP is not a legally viable alternative. Consequently, the No Project Alternative presented in this Final Program EIR is the continued implementation of the 2007 AQMP. Although it is unclear whether or not continued implementation of the 2007 AQMP is a feasible alternative because the SCAQMD is required to submit to U.S. EPA a PM2.5 AQMP that demonstrates attainment of the 2006 24-hour PM2.5 national ambient air quality standard by December 14, 2012, as explained above. However, continued implementation of the 2007 AQMP as the No Project Alternative is consistent with CEQA Guidelines §15126.6 (e)(2) (italics added):

"The 'no project' analysis shall discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, *as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services…*"

It should be noted that, except for air quality, there would be no further incremental impacts on the existing environment if no further action is taken. Although there are existing rules that may have future compliance dates, potential adverse impacts from these rules have already been evaluated in the Final Program EIR for the 2007 AQMP and subsequent rule-specific CEQA documents. Air quality would continue to improve to a certain extent, but it is unlikely that all state or federal ozone standards would be achieved as required by the federal and California CAAs. It is possible that the federal 24-hour PM2.5 standard may be achieved; however, it is unlikely that further progress would be made towards achieving the state PM2.5 standard as required by the California CAA.

6.3.2 More NOx Reductions Through Accelerated Penetration of Alternative Fuel Mobile Sources

This NOx heavy emission reduction alternative would have relied on accelerated penetration of alternative fuel on-road and off-road mobile sources. Specifically, this alternative would have required 50 percent of all heavy-duty on-road mobile sources subject to CARB's adopted Truck and Bus Regulation to meet the requirement of replacing heavy-duty on-road trucks and buses with trucks and buses that comply with the 2010 model year or newer final requirements by the year 2014. Similarly, this alternative would have required 50 percent of all off-road mobile sources subject to CARB's adopted off-road mobile sources regulations to meet the requirement of replacing heavy-duty off-road mobile sources that comply with Tier 4 or equivalent requirements by the year 2014.

Converting heavy-duty on-road mobile sources to year 2010 model year engines or off-road mobile sources to Tier 4 or equivalent standards has typically required incentive funding to offset the typically higher costs of the cleaner vehicles. Incentive funding sources include Carl Moyer or Proposition 1B funds. This NOx heavy emission reduction alternative is considered to be economically infeasible because insufficient funding would be available to meet the 50 percent penetration rate in the 2012 to 2014 timeframe.

6.3.3 Alternative Location

CEQA requires consideration of an alternative location alternative if significant effects of the project would be avoided or substantially lessened by putting the project in another location. Pursuant to CEQA Guidelines §15126.6 (f)(2)(B), if the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR. For example, in some cases there may be no feasible alternative locations for a geothermal plant or mining project which must be in close proximity to natural resources at a given location. The 2012 AQMP applies to the entire area of the SCAQMD's jurisdiction. The SCAQMD has no authority to adopt and enforce 2012 AQMP control measures in areas outside its jurisdiction. CEQA does not grant an agency new powers independent of the powers granted to the agency by other laws (CEQA Guidelines §15040 (b)). Therefore, an alternative locations alternative is not considered to be a feasible alternative

6.4 ALTERNATIVES TO THE 2012 AQMP

Because of the substantial emission reductions necessary to bring the region into attainment with the federal 24-hour PM2.5 standard, as well as the eight-hour ozone, the SCAQMD is relatively limited with regard to the number of potential alternatives to the 2012 AQMP. As a result, with the exception of the No Project Alternative, all project alternatives include the same short-term control measures to attain the federal 24-hour standard because of the requirement to attain the standard by 2014 and these measures would regulate or further regulate PM emission sources where emission reductions are feasible.

Although most of the project alternatives also include long-term measures, the primary difference between the various alternatives is the pollutant control strategies being employed. The alternatives rely to a greater or lesser extent on PM control to attain the federal 24-hour PM2.5 standard or NOx control to, not only attain the federal 24-hour PM2.5 standard, but to demonstrate progress in attaining the federal ozone standards as well. Similarly, the pollutant control strategy of the alternative may determine the extent to which the SCAQMD and CARB will rely on specific emission source categories to obtain future emission reductions. This means that the SCAQMD and CARB may rely to a greater or lesser extent on emission reductions from some source categories (e.g., on- and off-road mobile sources), compared to other source categories. The following subsections provide a brief description of the alternatives.

6.4.1 Alternative 1 – No Project Alternative (Continued Implementation of the 2007 AQMP)

CEQA requires the specific alternative of no project to be evaluated. A No Project Alternative consists of what would occur if the proposed project was not approved; in this case, not adopting the 2012 AQMP. The net effect of not adopting the 2012 AQMP would be a continuation of the 2007 AQMP. This approach is consistent with CEQA Guidelines §15126.6 (e)(3)(A), which states: "When no project is the revision on an existing land use or regulatory plan, policy or ongoing operation, the 'no project' alternative will be the continuation of the existing plan, policy, or operation into the future. Typically this is a situation where other projects initiated under the existing plan will continue while the new plan is developed. Thus, the projected impacts of the proposed plan or alternative plans would be compared to the impacts that would occur under the existing plan."

Between 2008 and 2011, twelve short-term control measures from the 2007 AQMP have been promulgated as rules or rule amendments by the SCAQMD. Promulgation of these 12 control measures has allowed the SCAQMD to achieve its stationary source emission reduction targets (see Table 1-2 in Chapter 1 of the 2012 AQMP). Similarly, since the 2007 AQMP was adopted, 2007 AQMP control measure commitments were adopted (either entirely or partially) by CARB (see Table 1-2 in Chapter 1 of the 2012 AQMP).

Based on the above information, it is assumed for this alternative that both the SCAQMD and CARB have achieved their 2007 AQMP short-term emission reduction targets. Therefore, the 2007 AQMP does not contain any remaining short-term stationary source or mobile source control measures (Table 6-1). Although there were a couple of short-term control measures remaining (e.g., BCM-05 - Emission Reductions from Under-fired Charbroilers, MCS-06 - Improved Start-up and Shutdown, and Turnaround Procedures, etc.), there are no emission reductions associated with them or they are, or will be under evaluation to determine the feasibility of potential emission reductions in the future. As a result, all remaining necessary emission reductions from continuing to implement the 2007 AQMP would be obtained through implementing CAA §182 (e)(5) ("black box") measures. Table 6-1 summarizes the components of Alternative 1 and associated assumptions.

TABLE 6-1

2012 AQMP and Alternatives

PLAN TYPE	ATTAINMENT YEAR	STATIONARY SOURCE CMS	ON-ROAD MOBILE SOURCE CMS	OFF-ROAD MOBILE SOURCE CMS	COMMENT
Proposed Project – 2012 AQMP					
1. PM2.5 Attainment Plan (Includes Ozone Attainment Control Measures) 2. Federal 1-hour Ozone Attainment Demonstration (Includes 7 2007 AQMP Mobile Source CMs) 3. VMT Offset Requirement Demonstration	1. PM2.5 – 2014 2. 1-hour Ozone Demonstration – 2022 3. 8-hour Ozone – 2023	8 categories: 1) PM Sources (4 CMs); 2) Combustion (4 CMs); 3) Coatings & Solvents (4 CMs); 4) Petroleum Operations & Fugitive VOC (3 CMs); 5) Multiple Component (3 CMs); 6) Indirect (1 CM); 7) Incentive (2 CMs); & 8) Educational (1CM)	5 CMs: 1) Accelerated Penetration – light, medium, & medium HD vehicles (2 CMS); 2) Accelerated retirement of – light, medium, & HD vehicles (2 CMS); & 3) Emission reductions from near-dock railyard drayage trucks (1 CM)	5 CMS: 1) Emission reductions from construction equipment (1CM) 2) Emission reductions from freight & passenger locomotives (2 CMs) 3) Emission reductions from marine vessels (2 CMs) 7 ADV CMs for future studies to further reduce emission from off-road sources	Includes episodic CMs: BCM-01 Further Emissions Reductions from Wood Burning Devices (Rule 445) & BCM-02 Further Reductions from Open Burning (Rule 444. ADV CMs are CAA §182 (e)(5) black box measures.

TABLE 6-1 (Continued)

2012 AQMP and Alternatives

PLAN TYPE	ATTAINMENT YEAR	STATIONARY SOURCE CMS	ON-ROAD MOBILE SOURCE CMS	OFF-ROAD MOBILE SOURCE CMS	COMMENT
Alternative 1 – No Project Alternative					
Continue Implementing 2007 AQMP: PM2.5 & 8-hour Ozone Attainment Plans	PM2.5 – 2019 Ozone – 2023	Assumes no remaining short-term CMs	Assumes no remaining short-term CMs	Assumes no remaining short-term CMs	SCAQMD & CARB have met their emission reduction obligations, so no other short-term CMs adopted. It is assumed all remaining necessary emission reductions obtained through adopting CAA §182 (e)(5) "black box" CMs, see Table 6-2.
Alternative 2 – PM2.5 Attainment Plan Localized PM Control in Mira Loma Area					
PM2.5 Attainment Plan (Includes Ozone Attainment Control Measures)	PM2.5 – 2017 Ozone – 2023	Same as 2012 AQMP except includes: 1) Multiple Component – 3 new localized episodic CMs for Mira Loma: **CMALT-2A** Reductions From Mobile Sources Serving Warehouse And Distribution Centers; **CMALT-2B** Residential Wood Burning Devices; & **CMALT-2C** Ammonia Reductions from Livestock Waste 2) Excludes **BCM-02** Open burning	Same as 2012 AQMP	Same as 2012 AQMP	Excludes **BCM-02** Further Reductions from Open Burning, (Rule 444). MCS CMs are episodic & would apply only to the Mira Loma area. This alternative was originally the 2012 AQMP project in the June 28, 2012 NOP/IS. Includes CAA §182 (e)(5) "black box" CMs

TABLE 6-1 (Continued)

2012 AQMP and Alternatives

PLAN TYPE	ATTAINMENT YEAR	STATIONARY SOURCE CMS	ON-ROAD MOBILE SOURCE CMS	OFF-ROAD MOBILE SOURCE CMS	COMMENT
Alternative 3 – Greater Reliance on NOx Emissions Reductions					
PM2.5 Attainment Plan (Includes Ozone Attainment Control Measures)	PM2.5 – 2017 Ozone – 2023	Same as 2012 AQMP except excludes: **BCM-01** Further Emissions Reductions from Wood Burning Devices, (Rule 445)	Same as 2012 AQMP except includes: **ONRD-03** Accelerated implementation of CARB's On-road Truck & Bus Regulation[a] from adoption date of 2008. Double CARB's assumed 2017 penetration rate of fleet to new 2010 model–year engines (assumes 25% of the total fleet go to CNG & the rest go to compliant diesel engines)	Same as 2012 AQMP except includes: **OFFRD-01** Accelerated implementation of CARB's Off-road Vehicle Regulation[b] from adoption date of 2007. Double CARB's assumed 2017 turnover rate of the fleet to cleaner engines or comparable.	Note: **BCM-02** Further Reductions from Open Burning, is included in this alternative. Includes CAA §182 (e)(5) "black box" CMs.

[a] Can be found at: http://www.arb.ca.gov/msprog/onroadhd/onroadhd.htm

[b] Can be found at: http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm

TABLE 6-1 (Concluded)

2012 AQMP and Alternatives

PLAN TYPE	ATTAINMENT YEAR	STATIONARY SOURCE CMS	ON-ROAD MOBILE SOURCE CMS	OFF-ROAD MOBILE SOURCE CMS	COMMENT
Alternative 4 – PM2.5 Emissions Reduction Strategies Only					
PM2.5 Control Measures Only, No Ozone Control Measures	PM2.5 – 2014	Same as 2012 AQMP 5 categories: 1) PM Sources (4 CMs); 2) Combustion (1 CM); 3) Multiple Component (1 CM); 4) Indirect (1 CM); 5) Educational (1 CM)	None	None	1. Does not include CAA §182 (e)(5) "black box" measures. 2. Includes implementing all remaining 2007 AQMP ozone control measures.

Table 6-2 shows the black box measure strategies from the 2007 AQMP. Because all control measures in Table 6-2 regulate mobile sources or the VOC content in consumer products, they are all considered to be ozone reduction control measures. The only exceptions to this assumption are the renewable energy and AB32 implementation control measures, which primarily address GHG emissions. Otherwise, there are no control measures in Alternative 1 that specifically address reducing PM2.5 emissions.

Although Table 6-2 shows the 2007 AQMP black box measures and also shows the §182 (e)(5) control measures from the 2012 AQMP that affect the same emissions sources, this does not imply that the 2007 AQMP measures analyzed in this Final Program EIR will be updated to conform to the 2012 AQMP control measures. The descriptions of the black box control measures from the 2007 AQMP analyzed here are exactly the same as their descriptions in the 2007 AQMP.

TABLE 6-2

Long-Term (Black Box) Control Measures from the 2007 AQMP

SOURCE CATEGORY	METHOD OF EMISSIONS CONTROL	2012 AQMP CONTROL MEASURES AFFECTING SAME SOURCE
Light Duty Vehicles (SCLTM-01A)	Extensive retirement of high-emitting vehicles and accelerated penetration of ATPZEVs and ZEVs	ONRD-01 & ADV-01
On-Road Heavy Duty Vehicles (SCLTM-01B)	• Expanded modernization and retrofit of heavy-duty trucks and buses • Expanded inspection and maintenance program • Advanced near-zero and zero-emitting cargo transportation technologies	ONRD-03, ONRD-05 & ADV-06
Off-Road Vehicles (SCLTM-02)	Expanded modernization and retrofit of off-road equipment	OFFRD-01 & ADV-06
Consumer Products (SCLTM-03)	Ultra Low-VOC formulations; Reactivity-based controls	CTS-04
Fuels	More stringent gasoline and diesel specifications; Extensive use of diesel alternatives	No update [a]
Marine Vessels	More stringent emission standards and programs for new and existing ocean-going vessels and harbor craft	IND-01, OFFRD-05 & ADV-05
Locomotives	Advanced near-zero and zero emitting cargo transportation technologies	OFFRD-02 & ADV-02

TABLE 6-2 (CONCLUDED)

Long-Term (Black Box) Control Measures from the 2007 AQMP

SOURCE CATEGORY	METHOD OF EMISSIONS CONTROL	2012 AQMP CONTROL MEASURES AFFECTING SAME SOURCE
Pleasure Craft	Accelerated replacement and retrofit of high-emitting engines	No update [a]
Aircraft	More stringent emission standards for jet aircraft (engine standards, clean fuels, retrofit controls); Airport bubble	ADV-07
Renewable Energy	Accelerated use of renewable energy and development of hydrogen technology and infrastructure	No update [a]
AB32 Implementation	Concurrent criteria pollutant reduction technologies	No update [a]

[a] No update means that the control measures have not been updated as part of the 2012 AQMP, which primarily addresses attaining the federal 24-hour PM2.5 standard, but also includes a federal one-hour ozone attainment demonstration.

The No Project Alternative analyzed here will take into account the most current air quality setting (2008) and will include updated and refined control measures, but no new control measures (Table 6-2).

6.4.2 Alternative 2 – PM2.5 Attainment Plan Localized PM Control in Mira Loma Area

Alternative 2 is the 2012 AQMP project that was included in the 8/2~~1~~/12 NOP/IS. This alternative is similar to the currently proposed 2012 AQMP with the following exceptions. Alternative 2 does not include Control Measure BCM-02 – Further Emission reductions from open burning because this measure was not included as part of the 2012 AQMP project description in the 8/2~~1~~/12 NOP/IS. Alternative 2 includes the same episodic control measures that would apply only to the Mira Loma area and described in the June 28, 2012 NOP/IS. The episodic control measures for the Mira Loma area, shown in Figure 6-1, are described in the following paragraphs.

Control Measure MCS-04 contains three sub-control measures, two PM2.5 control measures and one ozone control measure, targeting specific sources around Mira Loma (approximately within a 10-mile radial), including mobile sources serving warehouse and distribution centers, residential wood burning devices (e.g., fireplaces and wood stoves), and livestock waste. Air quality data through 2011 show that the Mira Loma monitoring station in western Riverside County is the only monitoring station violating the federal 24-hour PM2.5 standard. Emissions sources in the Mira Loma area that contribute to violations of the federal 24-hour PM2.5 standard include: 1) local PM emissions from the large concentration of warehouses that attract heavy-duty diesel haul trucks; and 2) transport of ammonia, a PM precursor, from dairies located downwind of the Mira Loma area (Figure 6-1). Therefore, the purpose of the sub-control measures under MCS-04 is to achieve a 1.0 µg/m3 PM2.5 air quality improvement (based on the 24-hour design value) at the Mira Loma station through targeted reductions of direct PM and NOx emissions from various sources in the areas around the monitoring station.

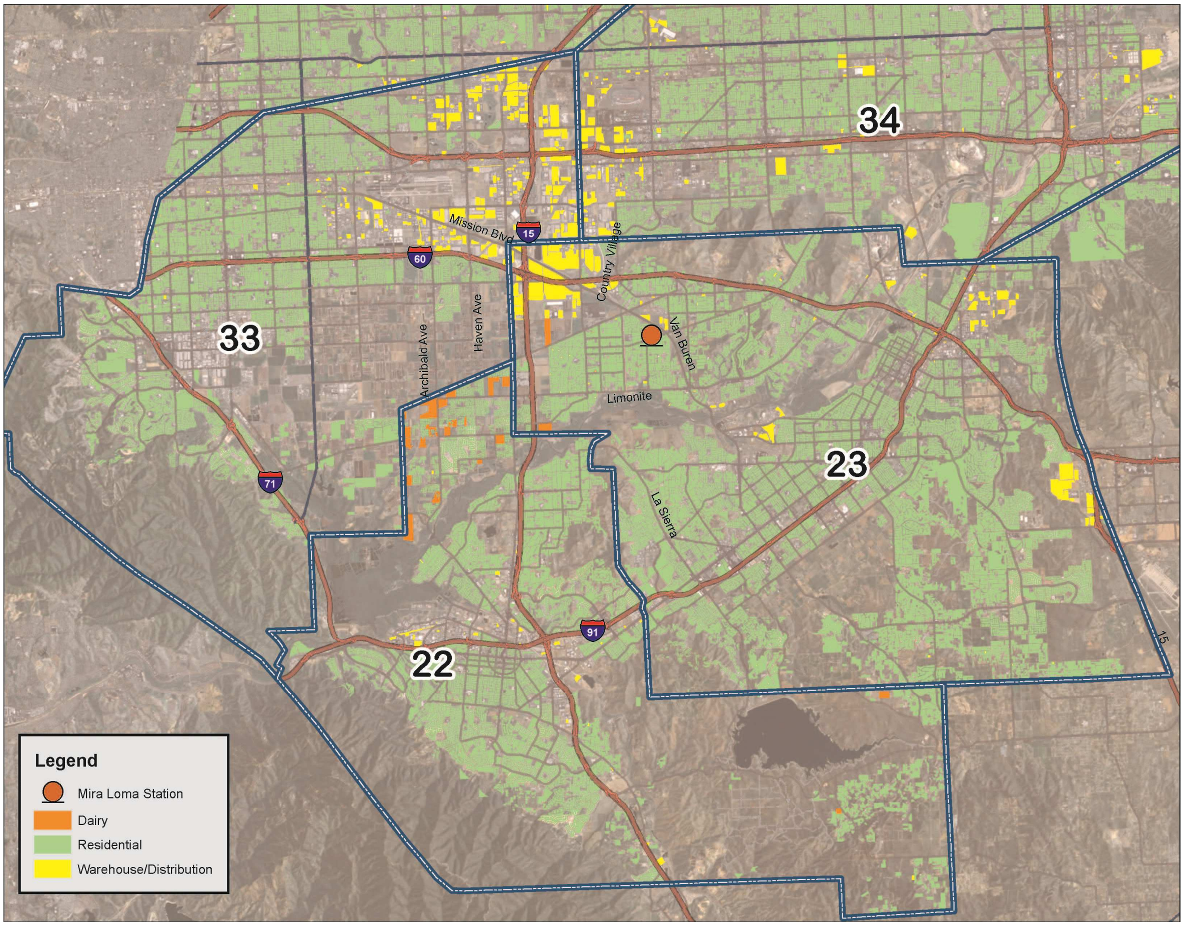

FIGURE 6-1

PM2.5 Emission Sources in the Mira Loma Area
(Numbers Represent Source Receptor Areas)

These control measures would be implemented sequentially and as needed to meet the 24-hour PM2.5 standard at the Mira Loma monitoring station. The mobile source control measure would be implemented initially, followed by the wood burning devices control measure. In the event ambient data indicate the 24-hour PM2.5 standard continues to be exceeded in Mira Loma in 2014 (single year, 98th percentile), the livestock measure would then be implemented in 2015 specifically applicable to dairies. If the 24-hour PM2.5 standard is not exceeded, each subsequent year would then be similarly assessed. U.S. EPA has suggested that such localized, and in some cases episodic or seasonal controls can be a very cost effective strategy for achieving the NAAQSs.

The specific sub-control measures identified in the 6/28/12 NOP/IS under MCS-04 were labeled as Control Measures MCS-04A, MCS-04B, and MCS-04C. They are relabeled to avoid confusion with the 2012 AQMP and are summarized in the following paragraphs.

CMALT-2A (*formerly MCS-04A and merged into ONRD-04 of the 2012 AQMP*) Further Emission Reductions From Mobile Sources Serving Warehouse And Distribution Centers Located Around The Mira Loma Region [NOx, PM]: Over the past decade, warehouse and distribution centers have been steadily increasing in size and number throughout the region. The greatest growth in warehouses/distribution centers has been in the Riverside area, especially the Mira Loma area (Figure 6-1), and San Bernardino areas. According to SCAG, by 2035 over one billion square feet of warehousing will be needed in the southern California area to support goods movement activities (SCAG, 2010).

Distribution centers and/or warehouses are facilities that serve as a distribution point for the transfer of goods. Such facilities include cold storage warehouses, goods transfer facilities, and transloading facilities, where imported goods are sorted, tagged, repackaged and prepared for retail distributions. These operations involve trucks, trailers, shipping containers, and other equipment with diesel engines. A warehouse/distribution center can be comprised of multiple centers or warehouse/distribution centers within an area. The size can range from 100,000 square feet to well over one million square feet. Depending on the size and type, a warehouse/distribution center may have hundreds of diesel trucks per day that deliver, load, and/or unload goods, generally operating seven days per week. To the extent that these trucks are transporting perishable goods, they are equipped with diesel-powered transport refrigeration units (TRUs) or TRU generator sets. The activities associated with delivering, storing, and loading freight produces NOx and PM emissions, including diesel particulate matter (DPM).

This sub-control would be a voluntary incentive program with the intent of reducing emission from older, pre-2010 heavy-duty vehicles beyond the emission reductions targeted in CARB's Truck and Bus Regulation. In addition, the proposed action would direct a portion of available public funding to assist in replacing older diesel trucks serving warehouse and distribution centers to a truck with an engine meeting on-road heavy-duty exhaust emission standards by 2015. The incentive program would place the highest priority on on-road vehicles that provide at least 75 percent of their service to warehouse and distribution centers in the Mira Loma region and have gross vehicle weight ratings of 26,001 lbs or greater.

Sub-Control Measure MCS-04 would only implemented if the federal 24-hour PM2.5 standard is exceeded. If needed to demonstrate attainment of the 24-hour PM2.5 standard at the Mira Loma monitoring station, Sub-Control Measure MCS-04 would be implemented first of the three sub-control measures. If the 24-hour PM2.5 standard is not exceeded in the Mira Loma area in 2014 (single year, 98th percentile), PM2.5 concentrations in each subsequent year would then be similarly assessed for any exceedances of the federal 24-hour PM2.5 standard.

CMALT-2B (*formerly 2007 AQMP Control Measure BCM-03; MCS-04B in the 6/28/12 NOP/IS; and is BCM-01 in the 2012 AQMP) Further Reductions from Residential Wood Burning Devices in Mira Loma Region)* [PM2.5] SCAQMD Rule 445 – Wood Burning Devices, was adopted in 2008 and prohibits the burning of any product not intended for use as a fuel (e.g., trash) in a wood burning device and requires commercial firewood facilities to only sell seasoned firewood (20 percent or less moisture content) from July through February. Rule 445 also establishes a mandatory wood burning curtailment program that extends from November 1 through the end of February each winter season. During a wood burning curtailment period, the public is required to refrain from both indoor and outdoor solid fuel burning in specific areas where PM2.5 air quality is forecast to exceed 35 $\mu g/m^3$ (federal 24-hour standard).

Under Sub-Control Measure CMALT-2B the current mandatory wood burning curtailment threshold would be lowered from 35 $\mu g/m^3$ to a more conservative 30 $\mu g/m^3$. This means that a mandatory wood burning curtailment would be implemented in the Mira Loma area when a PM2.5 level of greater than 30 $\mu g/m^3$ is forecast at monitoring stations in the Mira Loma area at any monitoring station at which the design value has exceeded the current PM2.5 24-hour standard of 35 $\mu g/m^3$ for either of the two previous years. The design value is the three-year average of the annual 98th percentile of monitored ambient PM2.5 data.

It is expected that, initially, the wood burning curtailment program would continue to target winter season emissions. In addition, the feasibility of an enhanced program to incentivize the purchase of gaseous fueled devices would be explored relative to areas in Mira Loma that are affected by high PM2.5 concentrations. For example, an enhanced incentive program for the Mira Loma community could result in the installation of as many as 2,000 units in existing residential homes.

It is expected that this sub-control measure would be implemented only if the federal PM2.5 standard continues to be exceeded in the Mira Loma area. In this situation, Sub-Control Measure CMALT-2A would be implemented first to address exceedances of the federal PM2.5 standard. If, after implementing Sub-Control Measure CMALT-2A, exceedances continue and data indicate the 24-hour PM2.5 standard is exceeded in Mira Loma in 2014 (single year, 98th percentile), only then would Sub-Control Measure CMALT-2B be implemented. If the 24-hour PM2.5 standard is not exceeded in the Mira Loma area in 2014 (single year, 98th percentile), PM2.5 concentrations in each subsequent year would then be similarly assessed for any exceedances of the federal 24-hour PM2.5 standard.

CMALT-2C (*formerly 2007 AQMP Control Measure MCS-05; MCS-04C in the 6/28/12 NOP/IS and BCM-04 in the 2012 AQMP*) Further Ammonia Reductions from Livestock Waste in Mira Loma Region [Ammonia] Ammonia contributes to formation of PM2.5 and mixes with transport emissions, particularly to form aerosol ammonium nitrate and ammonium sulfate. Livestock waste produces appreciable amounts of ammonia emissions. With the approval of Proposition 2 (known as cage-free proposition that passed in 2008), economic, and product demand climate, the livestock industry in the South Coast jurisdiction is not considered a growth industry into the future. Currently, however, there continues to be large concentrations of dairies downwind of the Mira Loma area (Figure 6-1), which contributes to exceedances of the federal PM2.5 standard.

Like 2012 AQMP Control Measure BCM-04, the purpose of the sub-control measure is to reduce ammonia emissions from livestock operations with emphasis on dairies in the Mira Loma area. This control measure would reduce the pH level in manure through the application of acidulant additives (acidifier) as mitigation for ammonia. The acidifier sodium bisulfate (SBS) is being considered for use in animal housing areas where high concentrations of fresh manure are. Research indicates best results with the use of SBS on localized "hot spots." SBS can also be applied to manure stock piles, high manure concentrations at fence lines, and when scraping manure to reduce ammonia spiking from the leftover remnants of manure and urine. Implementing this measure would become effective in the event ambient data indicates the 24-hour PM2.5 standard is exceeded in Mira Loma in 2014 (single year, 98th percentile). Before implementing Sub-Control Measure CMALT-2C, Sub-Control Measures CMALT-2A and MCS-04 B would be implemented. The livestock measure would then be implemented in 2015, specifically applicable to dairies. If not exceeded, each subsequent year would then be similarly assessed. In the interim, a pilot program will be conducted to further evaluate the application of SBS at local dairies so as to evaluate the direct technical and economic feasibility of application.

6.4.3 Alternative 3 – Greater Reliance on NOx Emissions Reductions

Alternative 3 would rely to a greater extent on NOx emission reductions, primarily from on- and off-road mobile sources as described in the following paragraphs, to achieve the federal 24-hour PM2.5 standard. Greater reliance on NOx emission reductions is considered a viable alternative because NOx is not only a PM2.5 precursor, it is also an ozone precursor, so this alternative would also be consistent with the SCAQMD's efforts to continue making expeditious progress in attaining the federal one-hour and eight-hour ozone standards.

Because this alternative relies more heavily on NOx emission reductions to attain the federal 24-hour PM2.5 standard, it does not include Control Measure BCM-01 - Further Emissions Reductions from Wood Burning Devices. Although direct PM2.5 emission reductions are more effective than NOx in reducing PM2.5 concentrations, early and greater reliance on Basin-wide NOx emission reductions from on- and off-road mobile sources would not only assist with attaining the PM2.5 standard, they would also contribute to making greater progress in attaining the one-hour and eight-hour ozone standards than might otherwise be the case. Otherwise Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP.

Generally, Alternative 3 includes all of the same ozone control measures as the 2012 AQMP, which includes stationary source control measures and CAA §182 (e)(5) stationary source, on-road mobile source, off-road mobile source, and advanced . Two ozone Control Measures, ONRD-03 and OFFRD-01, would be modified under Alternative 3 as explained in the following paragraphs.

Control Measure ONRD-03 would be modified to accelerate implementation of CARB's on-road truck and bus regulation, which was originally adopted December 12, 2008. The regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Heavier trucks must be retrofitted with PM filters beginning January 1, 2012, and older trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. The CARB regulation applies to nearly all privately- and federally-owned diesel fueled trucks and buses and privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. Small fleets with three or fewer diesel trucks can delay compliance and there are a number of extensions for low-mileage construction trucks, early PM filter retrofits, adding cleaner vehicles, and other situations. Privately and publicly owned school buses have different requirements.

Under Alternative 3 and ozone Control Measure ONRD-03, the rate of compliance with the statewide on-road truck and bus regulation would double by the year 2017 compared to the estimated compliance provided by CARB in the existing regulation for year 2017. Compliance with the increased penetration rate would be with engines that meet 2010 exhaust emission standards. Because there is more than one engine type that complies with the year 2010 engine exhaust requirements, it is unknown what the exact breakdown of compliant engine types will be in operation. Therefore, under this alternative it is assumed that 25 percent of the additional vehicles complying with the year 2010 engine exhaust standards would comply using CNG engines and the remainder would comply using diesel engines.

SCAQMD staff estimates that Alternative 3 could result in approximately 5,000 additional medium-heavy-duty trucks (14,000 to 26,000 pounds gross vehicle weight) complying with the year 2010 engine exhaust requirements for the years 2013 through 2017. This means that over the five years 2013 through 2017, 1,000 additional medium-heavy-duty trucks would comply with the year 2012 engine exhaust requirements. Consistent with the above assumption, approximately 250 of these medium-heavy-duty trucks would comply using CNG engines, while the remaining 750 would be compliant diesel or diesel hybrid trucks.

Finally, Alternative 3 ozone Control Measure OFFRD-01 would require accelerated implementation of CARB's off-road diesel vehicle regulation, which was originally adopted July 26, 2007. The overall purpose of the off-road regulation is to reduce NOx and PM emission from off-road diesel vehicles operating within California through increased turnover of older higher emitting vehicles to newer cleaner ones. The regulation applies to self-propelled diesel-fueled vehicles in California (except for agricultural or personal use, or for use at ports or intermodal railyards) with engines with a maximum rating of 25 horsepower or greater. The requirements and compliance dates of the Off-Road regulation vary by fleet size. To determine the size of their fleets, fleet operators must add up all of the off-road horsepower (hp) under common ownership or control in the fleet. For example, a small fleet would be comprised of a fleet with a total horsepower rating of less than or equal to 2,500 hp; a medium fleet would be comprised of a fleet with a total horsepower rating of 2,501 to 5,000 hp; and a large fleet would be comprised of a fleet with a total horsepower rating of over 5,000 hp (all state and federal fleets would be classified as large fleets regardless of hp rating). Large, medium and small fleets must begin complying with regulation requirements by the beginning of 2014, 2017, and 2019 respectively.

Alternative 3 ozone Control Measure OFFRD-01 would require CARB to amend the off-road vehicle regulation to require doubling the implementation rate of the regulation such that the emission reductions expected by 2021 (the 8th year of compliance) would be realized by the year 2017. SCAQMD staff estimates that doubling the implementation rate of CARB's off-road vehicle regulation would result in approximately 19,344 additional off-road engine repowers or vehicle replacements over the years 2014 to 2017 (Table 6-3). The reason that the accelerated regulation affects more than three times the number of vehicles, instead of simply doubling the number is that the regulation was designed to regulate more vehicles in the later years (the vehicle turnover percentage rises from 8 percent to 10 percent in 2018 and the small fleets need to comply beginning in 2019).

TABLE 6-3

Number of Additional Off-Road Vehicles Affected by Alternative 3

YEAR	CURRENT RULE	ACCELERATED RULE	# OF ADDITIONAL VEHICLES
2014	2,447	5,500	3,053
2015	3,186	5,164	1,978
2016	1,982	10,087	8,105
2017	3,536	9,742	6,206
Total	11,150	30,494	19,344

6.4.4 Alternative 4 – PM2.5 Emissions Reduction Strategies Only

As requested by the public during the public comment period for the June 28, 2012 NOP/IS, the SCAQMD has incorporated a PM2.5 reduction strategies only alternative. Alternative 4 is considered to be a legally viable alternative because the SCAQMD is only required to submit PM2.5 plan demonstrating attainment of the 2006 24-hour PM2.5 National Ambient Air Quality Standard no later than three years from the effective date of designation of nonattainment of the federal 24-hour PM2.5 standard, December 14, 2012. However, there is no federal requirement to submit an ozone plan by the same date as the PM2.5 plan, December 14, 2012.

Alternative 4 would only include the control measures in Table 6-4. None of the remaining CAA §182 (e)(5) control measures, which include all remaining stationary source control measures (see Table 4-3, 2012 AQMP) and all on-road, off-road, and ADV control measures (see Table 4-6, 2012 AQMP) would be included in Alternative 4.

Creating a PM2.5 reduction strategies only alternative means that the Ozone SIP portion of the 2007 AQMP would remain in effect. This means that the CAA §182 (e)(5) black box measures shown in Table 6-2 would continue to be considered for promulgation into rules or regulations in the future. Consequently the environmental analysis for this alternative would include potentially significant adverse environmental impacts from the measures listed in Tables 6-2 and 6-4.

TABLE 6-4

List of SCAQMD's Adoption/Implementation Dates and Estimated Emission Reductions from Short-Term PM2.5 Control Measures

NUMBER	TITLE	ADOPTION	IMPLEMENTATION PERIOD	REDUCTION (TPD)
CMB-01	Further NOx Reductions from RECLAIM [NOx] –*Phase I*	2013	2014	2-3
BCM-01	Further Reductions from Residential Wood Burning Devices [PM2.5]	2013	2013-2014	7.1[a]
BCM-02	Further Reductions from Open Burning [PM2.5]	2013	2013-2014	4.6 [b]
BCM-03 (*formerly BCM-05*)	Emission Reductions from Under-Fired Charbroilers [PM2.5]	Phase I – 2013 (*Tech Assessment*) Phase II - TBD	TBD	1 [c]
BCM-04	Further Ammonia Reductions from Livestock Waste [NH3]	Phase I – 2013-2014 (*Tech Assessment*) Phase II - TBD	TBD	TBD [d]
IND -01 (*formerly MOB-03*)	Backstop Measures for Indirect Sources of Emissions from Ports and Port-Related Sources [NOx, SOx, PM2.5]	2013	12 months after trigger	N/A[e]
EDU-01 (*formerly MCS-02, MCS-03*)	Further Criteria Pollutant Reductions from Education, Outreach and Incentives [All Pollutants]	Ongoing	Ongoing	N/A[e]
MCS-01 (*formerly MCS-07)*	Application of All Feasible Measures Assessment [All Pollutants]	Ongoing	Ongoing	TBD [d]

Source: Table 4-2, 2012 Air Quality Management Plan

a. Winter average day reductions based on episodic conditions and 75 percent compliance rate.
b. Reductions based on episodic day conditions.
c. Will submit into SIP once technically feasible and cost effective options are confirmed.
d. TBD means reductions to be determined once the technical assessment is complete, and inventory and control approach are identified.
e. N/A means reductions that cannot be quantified due to the nature of the measure (e.g., outreach, incentive programs) or if the measure is designed to ensure reductions that have been assumed to occur will in fact occur.

6.5 ALTERNATIVES ANALYSIS

The following subsections include the same environmental topic areas evaluated for the proposed 2012 AQMP. Under each environmental topic area, impacts and significance conclusions are summarized for the proposed 2012 AQMP. In addition, potential impacts generated by each alternative to that environmental topic are described, a significance determination is made for the alternative, and environmental impacts from each alternative are compared to the environmental impacts identified for the proposed project.

6.5.1 Aesthetics

The potential direct and indirect aesthetics impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of direct and indirect aesthetics impacts from each alternative relative to the 2012 AQMP.

6.5.1.1 Proposed Project

Potential direct and indirect aesthetics impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis of potential aesthetics impacts from implementing the 2012 AQMP, refer to Subchapter 4.1 – Aesthetics.

6.5.1.1.1 PM2.5 Control Measures

The analysis in Subchapter 4.1 indicated that no 2012 AQMP PM2.5 control measures were identified that have the potential to significantly adversely affect aesthetics resources. Therefore, potential impacts to aesthetics resources are concluded to be less than significant.

6.5.1.1.2 Ozone Control Measures

The analysis in Subchapter 4.1 identified the following 2012 AQMP ozone control measures as having the potential to create significant adverse aesthetics impacts, including visual impacts and impacts to scenic highways, ozone Control Measures ONRD-05, ADV-01, and ADV-2. These control measures identify "wayside" power (such as electricity from overhead wires) as one of the zero emission technologies that could be used to reduce emissions from heavy-duty trucks and locomotives. Wayside power technologies include overhead catenary lines, where power is delivered from the electrical grid through the overhead wire to a pantograph on the vehicle itself. Catenary systems are well-established and efficient in light-rail applications, trolley cars and buses, and even mining trucks.

Control Measure ADV-01 indicates that the I-710 corridor was selected as high priority for introduction of zero-emission technology[1]. The 2012-2035 RTP/SCS also designates a route

[1] Los Angeles County Metropolitan Transportation Authority, *Alternative Goods Movement Technology Analysis-Initial Feasibility Study Report, Final Report: I-710 Corridor Project EIR/EIS*. Prepared by URS. January 6, 2009.

along the State Route 60 freeway as an east-west freight corridor[2]. Both of these corridors are currently heavily used freight corridors. In addition, there is currently a pilot project under consideration to install catenary lines at one of two sites, a site along the Terminal Island Freeway and on Navy Way at the Port of Los Angeles. Further, the most likely areas affected by these control measures are likely to be within five miles of the San Pedro Bay Ports complex because the heavy-duty truck measures affect near-dock truck transport. Finally, the I-710 freeway, State Route 60, and the roadways that may be chosen for the pilot project are not identified as scenic highways or eligible to be classified as scenic roadways nor are there any scenic highways or highways eligible for state scenic highway status.

6.5.1.1.3 Project-specific and Cumulative Impacts Conclusion

Overall, it was concluded in Subchapter 4.1 that the construction and operation of the catenary or overhead power lines that could be used to power Zero and Near Zero vehicles and locomotives are not expected to be visible to any Scenic Highway or any roadway eligible as a Scenic Highway. Therefore, project-specific aesthetics impacts associated with the 2012 AQMP are less than significant.

Since, anticipated project-specific aesthetics impacts from the 2012 AQMP are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific aesthetics impacts from the 2012 AQMP were evaluated in connection with aesthetic impacts from SCAG's 2012-2035 RTP/SCS. Further, it was concluded that aesthetics impacts from the 2012 AQMP would not contribute to significant adverse cumulative aesthetics impacts from the 2012-2035 RTP/SCS. Since aesthetics impacts from the 2012 AQMP are not cumulatively considerable and don't contribute to cumulative impacts generated by the 2012-2035 RTP/SCS, cumulative aesthetics impacts from the 2012 AQMP are not significant.

6.5.1.2 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final Program EIR for the 2012 AQMP, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. The only remaining control measures are the black box measures. Since the 2007 AQMP now includes only black box measures, the aesthetics impacts analysis for Alternative 1 will focus only on potential aesthetics impacts identified for the black box measures. Potential aesthetics impacts from implementing Alternative 1 are described in the Subsections 6.5.1.2.2 and 6.5.1.2.3.

[2] Los Angeles County Metropolitan Transportation Authority, *Alternative Goods Movement Technology Analysis-Initial Feasibility Study Report, Final Report: I-710 Corridor Project EIR/EIS*. Prepared by URS. January 6, 2009.

6.5.1.2.1 Alternative 1 Analysis Assumptions

If 2007 AQMP black box control measures contributed to impacts in any environmental topic areas that were concluded to be less than significant, it is assumed that they would continue to contribute impacts to those environmental topic areas, but impacts would be less than significant. Conversely, if 2007 AQMP black box control measures contributed to impacts to any environmental topic areas that were concluded to be significant, it is assumed for this analysis that they would continue to contribute to significant adverse impacts to those environmental topic areas. If 2007 AQMP black box control measures were not identified as contributing to impacts to an environmental topic area, for this analysis it was also assumed that they would not contribute to impacts to those environmental topic areas. For example, if it was concluded in the 2007 AQMP that the overall significance determination for an environmental topic area would be significant, but no black box control measures contributed to that significant adverse impact, it is assumed here that black box control measures that are part of Alternative 1 would also not contribute to significant adverse impacts to that environmental topic area. These same assumptions will be used for all subsequent environmental topics analyzed under Alternative 1.

6.5.1.2.2 PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason and the fact that aesthetics was not an environmental topic identified in the NOP/IS for the 2007 AQMP that could be adversely affected by that AQMP, Alternative 1 is not expected to create any impacts to aesthetics resources from PM2.5 control measures.

6.5.1.2.3 Ozone Control Measures

All remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. As shown in Table 6-2, 2012 AQMP Control Measure ONRD-05 would regulate the same emissions sources as 2007 AQMP Control Measure Off-Road Vehicles (SCLTM-02) (e.g., heavy-duty trucks using control technologies such as: expanded modernization and retrofit of heavy-duty trucks and buses; expanded inspection and maintenance program; and advanced near-zero and zero-emitting cargo transportation technologies). However, catenary systems were not identified as a possible method of reducing heavy-duty truck emissions. In fact, it was concluded in the NOP/IS for the 2007 AQMP that some control measures may have beneficial effects on scenic resources by improving visibility as well as improving air quality, preventing smoke, limiting opening burning and wood burning; and minimizing fugitive dust emissions. Therefore, it is concluded that Alternative 1 does not have the potential to generate significant adverse aesthetics impacts.

6.5.1.2.4 Project-specific and Cumulative Impacts Conclusion

The NOP/IS for the 2007 AQMP concluded that the 2007 AQMP ozone control measures would not generate any aesthetics impacts. Therefore, consistent with the assumptions in

Subsection 6.5.1.2.1, it is presumed that, overall, Alternative 1 would not generate significant adverse project-specific aesthetics impacts.

Since, anticipated project-specific aesthetics impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project specific aesthetics impacts would be approximately equivalent to those generated by the 2012 AQMP, Alternative 1 would also not contribute to significant adverse cumulative impacts generated by the 2012-2035 RTP/SCS. Since aesthetics impacts from Alternative 1 are not cumulatively considerable, cumulative aesthetics impacts from Alternative 1 are not significant.

6.5.1.3 Alternative 2 – PM2.5 Attainment Plan Localized PM Control in Mira Loma Area

As explained in Subsection 6.4.2, with the exception of the two episodic PM2.5 control measures for Mira Loma[3], CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS) and CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), and one episodic ozone Control Measure CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. As explained in the following subsections, potential aesthetics impacts from implementing Alternative 2 would be the same as potential aesthetics impacts from implementing the 2012 AQMP. For the complete analysis of aesthetics impacts from the 2012 AQMP, refer to Subchapter 4.1 – Aesthetics. Potential aesthetics impacts from implementing Alternative 2 are described in the following subsections.

6.5.1.3.1 PM2.5 Control Measures

Similar to the analysis of aesthetics impacts for the 2012 AQMP in Subchapter 4.1, no PM2.5 control measures were identified from implementing Alternative 2 that have the potential to significantly adversely affect aesthetics resources. The two episodic control measures in this alternative that would apply only to the Mira Loma area do not contain any provisions for reducing heavy-duty truck emissions using wayside electricity such as catenary electric lines. None of the two PM2.5 control measures in the 2012 AQMP that regulates the same sources as the episodic control measures in Alternative 2 was identified as contributing to aesthetics impacts. Therefore, potential impacts to aesthetics resources from implementing the 2012 AQMP were concluded to be less than significant. This same conclusion applies to Alternative 2.

6.5.1.3.2 Ozone Control Measures

Because Alternative 2 contains the same ozone control measures as the 2012 AQMP, except that ozone control measures CMALT-2A (similar to 2012 AQMP Control Measure ONRD-04) applies only to the Mira Loma area, aesthetics impacts from implementing Alternative 2

[3] As indicated in Subsection 6.4.2, Alternative 2 control measures CMALT-2C, which would reduce ammonia emissions from livestock waste in the Mira Loma area, is identical to 2012 control measure BCM-04.

ozone control measures would be the same as the aesthetics impacts from implementing the 2012 AQMP ozone control measures. As shown in the analysis of aesthetics impacts for the 2012 AQMP in Subchapter 4.1, implementing ozone control measures from Alternative 2 (e.g., ozone Control Measures ONRD-05, ADV-01, and ADV-2) has the potential to generate adverse impacts to aesthetics resources, scenic highways in particular. No other 2012 AQMP ozone control measures were identified that could affect aesthetic resources. Such impacts associated with implementing the 2012 AQMP ozone control measures would be less than significant, as no scenic highways or highways eligible for scenic highway status would be adversely affected as a result of installing catenary lines in the future. This same conclusion applies to Alternative 2 because it contains the same three ozone control measures that have the potential to affect aesthetics resources.

6.5.1.3.3 Project-specific and Cumulative Impacts Conclusion

Overall, potential project-specific adverse aesthetics impacts from Alternative 2 would be the same as potential project-specific aesthetics impacts from the 2012 AQMP and less than significant, because construction and operation of the catenary or overhead power lines that could be used to power Zero and Near Zero vehicles and locomotives are not expected to be visible to any Scenic Highway or any roadway eligible as a Scenic Highway.

Since, anticipated project-specific aesthetics impacts from Alternative 2 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project specific aesthetics impacts would be equivalent to those generated by the 2012 AQMP, Alternative 2 would also not contribute to significant adverse cumulative impacts generated by the 2012-2035 RTP/SCS. Since aesthetics impacts from Alternative 2 are not cumulatively considerable, cumulative aesthetics impacts from Alternative 2 are not significant and equivalent to the 2012 AQMP.

6.5.1.4 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except it does not include 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. As explained in the following subsections, potential aesthetics impacts from implementing Alternative 3 would be the same as potential aesthetics impacts from implementing the 2012 AQMP. For the complete analysis of aesthetics impacts from the 2012 AQMP, refer to Subchapter 4.1 – Aesthetics.

6.5.1.4.1 PM2.5 Control Measures

Similar to the analysis of aesthetics impacts for the 2012 AQMP in Subchapter 4.1, no PM2.5 control measures were identified from implementing Alternative 3 that have the potential to significantly adversely affect aesthetics resources. Potential impacts to aesthetics resources from implementing the 2012 AQMP were concluded to be less than significant (see Subchapter 4.1 of this Final Program EIR). This same conclusion applies to Alternative 3.

6.5.1.4.2 Ozone Control Measures

Similar to the analysis of aesthetics impacts for the 2012 AQMP in Subchapter 4.1, implementing ozone control measures from Alternative 3 (e.g., ozone Control Measures ONRD-05, ADV-01, and ADV-02) has the potential to generate adverse impacts to aesthetics resources, scenic highways in particular. No other 2012 AQMP ozone control measures were identified that could affect aesthetic resources. Such impacts associated with implementing 2012 AQMP ozone control measures would be less than significant, as no scenic highways or highways eligible for scenic highway status would be adversely affected as a result of installing catenary lines in the future. This same conclusion applies to Alternative 3 because it contains the same three ozone control measures that have the potential to affect aesthetics resources.

6.5.1.4.3 Project-specific and Cumulative Impacts Conclusion

Overall, potential project-specific adverse aesthetics impacts from Alternative 3 would be the same as potential project-specific aesthetics impacts from the 2012 AQMP and less than significant, because construction and operation of the catenary or overhead power lines that could be used to power Zero and Near Zero vehicles and locomotives are not expected to be visible to any Scenic Highway or any roadway eligible as a Scenic Highway.

Since, anticipated project-specific aesthetics impacts from Alternative 3 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project specific aesthetics impacts would be approximately equivalent to those generated by the 2012 AQMP, Alternative 3 would also not contribute to significant adverse cumulative impacts generated by the 2012-2035 RTP/SCS. Since aesthetics impacts from Alternative 3 are not cumulatively considerable, cumulative aesthetics impacts from Alternative 3 are not significant and equivalent to the 2012 AQMP.

6.5.1.5 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.4, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter. For the complete analysis of aesthetics impacts from 2012 AQMP PM2.5 control measures, refer to Subchapter 4.1 – Aesthetics. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2. As a result, impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1. Potential aesthetics impacts from implementing Alternative 4 are described in the following subsections.

6.5.1.5.1 PM2.5 Control Measures

Similar to the analysis of aesthetics impacts for the 2012 AQMP in Subchapter 4.1, no PM2.5 control measures were identified from implementing Alternative 4 that have the potential to significantly adversely affect aesthetics resources. Potential impacts to aesthetics resources from implementing the 2012 AQMP were concluded to be less than significant (see Subchapter 4.1 of this Final Program EIR). This same conclusion applies to Alternative 4.

6.5.1.5.2 Ozone Control Measures

Adopting Alternative 4 means that the ozone SIP portion of the 2007 AQMP would remain in effect. As shown in Table 6-2 and discussed in subsection 6.5.1.2.3, 2012 AQMP Control Measure ONRD-05 would regulate the same emissions sources as 2007 AQMP Control Measure On-road Heavy-duty Vehicles (SCLTM-01B) (e.g., heavy-duty trucks using control technologies such as: expanded modernization and retrofit of heavy-duty trucks and buses; expanded inspection and maintenance program; and advanced near-zero and zero-emitting cargo transportation technologies). However, catenary systems were not identified as a possible method of reducing heavy-duty truck emissions. In fact, it was concluded in the NOP/IS for the 2007 AQMP that some control measures may have beneficial effects on scenic resources by improving visibility as well as improving air quality, preventing smoke, limiting opening burning and wood burning; and minimizing fugitive dust emissions. Therefore, it is concluded that Alternative 4 does not have the potential to generate significant adverse aesthetics impacts and impacts would be less than aesthetics impacts from the 2012 AQMP.

6.5.1.5.3 Project-specific and Cumulative Impacts Conclusion

Based upon the above conclusions, when considering overall aesthetics impacts from implementing Alternative 4, no significant adverse aesthetics impacts were identified from implementing PM2.5 or ozone control measures. Therefore, it is presumed that Alternative 4 would not generate significant adverse aesthetics impacts. Finally, it is concluded that potential adverse aesthetics impacts from implementing Alternative 4 would be less than for the 2012 AQMP because unlike the 2012 AQMP, Alternative 4 does not contain any control measures that adversely affect aesthetics resources.

Since, anticipated project-specific aesthetics impacts from Alternative 4 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project specific aesthetics impacts would be less than those generated by the 2012 AQMP, Alternative 4 would also not contribute to significant adverse cumulative impacts generated by the 2012-2035 RTP/SCS. Since aesthetics impacts from Alternative 4 are not cumulatively considerable, cumulative aesthetics impacts from Alternative 4 are not significant and less than the 2012 AQMP.

6.5.2 Air Quality

The potential direct air quality effects of implementing the proposed project and the project alternatives were modeled to determine their effectives in attaining the federal 24-hour PM2.5 standard. Modeling was also conducted to evaluate the effectiveness of the proposed project and project alternatives with regard to continued progress in achieving the one-hour and eight-hour ozone standards by 2023. Potential adverse secondary air quality impacts for the proposed project and project alternatives were also evaluated. The following subsections provide brief discussions of direct and indirect air quality impacts from each alternative relative to the 2012 AQMP.

6.5.2.1 Methodology

The same models and methodology used to evaluate the effects of 2012 AQMP control measures were used to evaluate direct air quality impacts from the project alternatives. The methodology and assumptions used to analyze direct air quality impacts are summarized in the following paragraphs. For more complete discussions of the models and assumptions, the reader is referred to Chapter 5 of the 2012 AQMP and 2012 AQMP Appendix V~~5~~ – Modeling and Attainment Demonstrations.

PM2.5 is either directly emitted into the atmosphere (primary particles) or is formed through atmospheric chemical reactions from precursor gases (secondary particles). While the primary particles include road dust, diesel soot, combustion products, and other sources of fine particles, the secondary particles, such as sulfates, nitrates, and complex carbon compounds are formed from reactions with precursor pollutants, such as SOx, NOx, VOCs, and ammonia. These secondary particles make up most of the fine particle pollution in the Basin. Accordingly, reductions of the precursor pollutants contribute to lower ambient PM2.5 concentration levels so various combinations of reductions of these pollutants could all provide different paths to attaining the 24-hour PM2.5 standard.

The full extent of PM2.5 chemistry is extremely complex and can be calculated only with a very comprehensive numerical model that incorporates various mechanisms of chemical reactions, mixing, dispersion, removal process, and so on.

The Final 2007 AQMP established a set of factors relating regional per ton precursor emissions reductions to microgram per cubic meter improvements of ambient PM2.5 for the annual average concentration. The current CMAQ model simulations provide a similar set of factors, but this time related to 24-hour average PM2.5. For 24-hour average PM2.5, the simulations determined that VOC emissions reductions have the lowest benefit in terms of micrograms per cubic meter ambient PM2.5 reduced per ton of emissions reduction, half of NOx's effectiveness. The analysis further indicated that SOx emissions were about six times more effective than NOx, and that directly emitted PM2.5 is approximately 14 times more effective than NOx. It is important to note that the contribution of ammonia emissions is embedded as a component of the SOx and NOx factors, since ammonium nitrate and ammonium sulfate are the resultant particulate compounds formed in the ambient chemical process.

The 2012 AQMP PM2.5 attainment demonstration has been developed using the U.S. EPA supported Community Multiscale Air Quality (CMAQ) modeling platform, and the Weather Research and Forecasting Model (WRF) meteorological fields. The WRF meteorological simulations were initialized from National Centers for Environmental Prediction (NCEP) analyses and run for four-day increments with the option for four dimensional data assimilation (FDDA).

The emission inventory was prepared with a series of processes to retrieve stationary, mobile, area and biogenic emissions sources. Day-specific point source emissions were extracted from the SCAQMD's stationary source and RECLAIM inventories. Mobile source emissions include weekday, Saturday, and Sunday emission profiles based on CARB's on-road mobile source 2011 Emission Factors model (EMFAC 2011); Caltrans weigh-in-motion profiles; vehicle population and miles traveled; and transportation analysis zone (TAZ) data provided by SCAG. The mobile source data and selected area source data were subjected to daily temperature corrections to account for enhanced evaporative emissions on warmer days. Gridded daily biogenic VOC emissions were provided by CARB using the Model of Emissions of Gases and Aerosols from Nature (MEGAN). Once the emissions inventories for the modeling base year (year 2008 in the 2012 AQMP) were established, future years' inventories for each of the project alternatives were developed based on control measures already adopted through previous AQMPs, inventory projections to future milestone years, and the proposed emission control strategies for each project alternative. This same methodology was applied to the project alternatives, except that the control strategies were modified to account for the different pollutant control strategies embodied in each alternative.

In addition to the numerical modeling, the 2012 AQMP approach to demonstrate attainment of the air quality standards relies heavily on the use of design values and relative response factors (RRF) to translate regional modeling simulation output to the form of the air quality standard. The design value is derived from three consecutive years of monitored data, averaged according to the form of the standard. The 24-hour PM2.5 design value is determined from the three-year average of the 98^{th} percentile of all 24-hour concentrations sampled at a monitoring site. The annual PM2.5 design value is based on quarterly average PM2.5 concentrations, averaged by year, for a three-year period. The Relative Response Factor (RRF) is simply a ratio of future year predicted air quality with the control strategy fully implemented to the simulated air quality in the base year. From these two, the future year design value is estimated by multiplying the non-dimensional RRF by the base year design value and then compared with the standard to determine future year compliance.

Subsequent to the release of the Draft Program EIR, control measures with associated emission reduction values were re-evaluated for the 2012 AQMP and all alternatives resulting in minor modifications to the pollutant emissions inventories, NOx equivalent values, and PM2.5 concentrations derived from the NOx equivalen values. These minor revisions do not change any of the conclusions for air quality for the 2012 AQMP or any of the project alternatives.

6.5.2.2 Proposed Project

Potential direct and indirect air quality impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.2 – Air Quality.

6.5.2.2.1 Direct Air Quality Impacts – PM2.5 Control Measures

The 2012 AQMP demonstrated that the federal 24-hour and annual PM2.5 standards are predicted to be met in 2014 with implementation of the 2012 AQMP PM2.5 control strategy.

The highest 24-hour and annual PM2.5 in the Basin were predicted to be 34.2 µg/m3 and 13.8 µg/m3, respectively, which are lower than the federal standards. The 2012 AQMP control strategy targets directly emitted PM2.5, as is evident in the 58 tons per day (tpd) of PM2.5 emissions in the 2012 AQMP.

TABLE 6-5

2012 AQMP – PM2.5 Remaining Inventory [a] (Tons/Day)

	POLLUTANT				
SOURCE CATEGORY	**VOC**	**NOx**	**CO**	**SOx**	**PM2.5**
Baseline Year 2008 Average Annual Day (tpd)					
Total Stationary Sources	257	92	137	14	48
Total Mobile Sources	336	666	2,744	40	32
Total	**593**	**758**	**2,881**	**54**	**80**
Year 2014 – 2012 AQMP Average Annual Day (tpd) [b]					
Total Stationary Sources	234	77 ~~1~~	164	12	38
Total Mobile Sources	217	414 ~~29~~	1,931	6	20
Total	**451**	**491 ~~500~~**	**2,095**	**18**	**58**
Year 2017 – 2012 AQMP Average Annual Day [c] (tpd)					
Total Stationary Sources	237	74 ~~68~~	165	11	39
Total Mobile Sources	188	377	1,702	7	19
Total	**425**	**451 ~~45~~**	**1,867**	**18**	**58**
Year 2019 – 2012 AQMP Average Annual Day [c] (tpd)					
Total Stationary Sources	239	~~6~~ 72	165	11	40
Total Mobile Sources	170	331 ~~0~~	1,151	7	18
Total	**409**	**403 ~~397~~**	**1,716**	**18**	**58**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Demonstrate attainment of the federal 24-hour PM2.5 standard.

[c] Continues to demonstrate attainment of the federal 24-hour PM2.5 standard.

6.5.2.2.2 Direct Air Quality Impacts – Ozone Control Measures

~~Because t~~The 2012 AQMP is primarily a PM2.5 AQMP as required by the CAA, ~~all~~ primarily emission reductions are based on PM2.5 control measures. The 2012 AQMP also includes control measures for making expeditious progress in attaining the federal one-hour (revoked) and eight-hour ozone standards by the years2022 – 2023, respectively. Table 6-6 shows that implementing the 2012 AQMP would continue to make progress towards attaining the federal one-hour and eight-hour ozone standards, but it would not attain either of the federal ~~one-hour or~~ eight-hour ozone standards, as shown in Table 6-6. ~~However, is not technically an ozone attainment AQMP.~~ An ~~ozone attainment~~ AQMP specifically addressing the eight-hour ozone standard will be prepared and submitted to U.S. EPA in 2015 as required by federal law.

As indicated in Chapter 2, the U.S. EPA's September 19, 2012 proposed "SIP call" and proposed withdrawing its approval/disapproval of the TCM demonstrations, also referred to as VMT emissions offset demonstrations, in the 2003 one-hour ozone plan and the 2007 eight-hour ozone plan. In response to U.S. EPA's disapproval of the VMT emissions offset demonstrations, has resulted in the preparation of the *One-hour Ozone Attainment Demonstration* (see 2012 AQMP Appendix VII) and *VMT Offset Requirement Demonstration* (2012 AQMP Appendix VIII). These documents were reviewed by SCAQMD staff to determine any CEQA implications.

Because the federal one-hour ozone SIP includes all of the same ozone control measures already in the 2012 AQMP and the VMT offset demonstration showed that no new TCMs are required for the one-hour ozone SIP, this Final Program EIR for the 2012 AQMP also serves as the CEQA document for the one-hour ozone SIP. Further, *One-hour Ozone Attainment Demonstration* includes seven mobile source control measures from the 2007 AQMP. Because a CEQA document was prepared and certified for the 2007 AQMP and because the 2007 AQMP control measures do not require any changes, no further environmental analysis of the 2007 AQMP control measures is required.

TABLE 6-6

2012 AQMP – Remaining Emission Inventory [a] for Ozone Attainment Evaluation (Tons/Day)

	POLLUTANT	
SOURCE CATEGORY	**VOC**	**NOx**
Baseline Year 2008 Summer Planning Inventory (tpd)		
Total Stationary Sources	264	87
Total Mobile Sources	375	634
Total	**639**	**721**
Year 2023 – 2012 AQMP Summer Planning Inventory (tpd)		
Total Stationary Sources	254	66 ~~0~~
Total Mobile Sources	177	227
Total	**431**	**293 ~~87~~**
Year 2023 – Ozone Attainment Inventory (tpd)		
Total Carrying Capacity: 8-Hr standard [b]	**420**	**114**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Inventory necessary to achieve 80 ppb to attain the federal eight-hour ozone standard by 2023.

6.5.2.2.3 Secondary Air Quality Impacts – PM2.5 Control Measures

Construction: Construction air quality impacts associated with a number of 2012 AQMP PM2.5 control measures were identified and evaluated. It was assumed that the following types of construction activities to implement 2012 AQMP PM2.5 control measures contribute to construction activities emission inventories: 1) additional infrastructure to support electric and alternative fuel vehicles; 2) additional infrastructure for stationary source controls; and, 3) additional infrastructure to support electrification of new sources. It was concluded that these PM2.5 control measures have the potential to contribute to significant adverse secondary air quality impacts as the increase in the construction emission inventories for CO and PM10 from the baseline to the year 2023 would increase in an amount that would exceed the applicable construction air quality significance thresholds of 550 and 150 pounds per day, respectively (refer to Table 4.2-4). Because future construction air quality impacts were concluded to be significant, seven mitigation measures were identified to reduce potentially significant CO and PM10 construction air quality impacts. In spite of implementing these eight construction air quality mitigation measures, CO and PM10 construction air quality impacts would remain significant.

Operation: Secondary air quality impacts associated with approximately seven 2012 AQMP PM2.5 control measures were also identified and evaluated. For example, several PM2.5 control measures have the potential to generate secondary criteria pollutant, toxic air contaminant, and GHG emissions from and electricity generation. Additional emission controls could result in increased electricity use and an associated increase in criteria pollutant and GHG combustion emissions. Further, increased use of alternative fuels could generate criteria pollutant and GHG emissions associated with the increased production. Installation of emission control technologies on some sources has the potential reduce engine efficiency resulting in combustion of more fuel and an increase in criteria pollutant and GHG emissions. Potential air toxic impacts could occur as a result of formulating coatings and solvents with more toxic materials than are currently used. The analysis concluded, however, that secondary operational emissions from increased electricity demand, control of stationary sources, coatings and solvents formulated with low VOC materials, use of alternative fuels in mobile sources, increase us of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone depletion would be less than significant.

6.5.2.2.4 Secondary Air Quality Impacts – Ozone Control Measures

Construction: Construction air quality impacts associated with approximately 14 2012 AQMP ozone control measures were identified and evaluated. It was assumed that the following types of construction activities to implement 2012 AQMP ozone control measures contribute to construction activities emission inventories: 1) additional infrastructure to support electric and alternative fuel vehicles; 2) additional infrastructure for stationary source controls; and, 3) additional infrastructure to support electrification of new sources. It was concluded that these ozone control measures have the potential to contribute to significant adverse secondary air quality impacts as the increase in the construction emission inventories for CO and PM10 from the baseline to the year 2023 would increase in an amount that would exceed the applicable construction air quality significance thresholds of

550 and 150 pounds per day, respectively (refer to Table 4.2-4). Because future construction air quality impacts were concluded to be significant, eight mitigation measures were identified to reduce potentially significant CO and PM10 construction air quality impacts. In spite of implementing these eight construction air quality mitigation measures, CO and PM10 construction air quality impacts would remain significant.

Operation: Secondary air quality impacts associated with a number of 2012 AQMP ozone control measures were also identified and evaluated. The following bullet points show potential impacts from implementing ozone control measures and the significance determination.

- Secondary Emissions from Increased Electricity Demand: While there may be an increase in electricity, the existing air quality rules and regulations are expected to minimize emissions associated with increased generation of electricity. The impacts associated with secondary emissions from increased electricity demand are expected to be less than significant.
- Secondary Emissions from the Control of Stationary Sources: No significant secondary air quality impacts from control of stationary sources were identified associated with implementation of the 2012 AQMP.
- Secondary Emissions from Change in Use of Lower VOC Materials: The secondary air quality impacts associated with reformulated products are expected to be less than significant.
- Secondary Emissions from Mobile Sources: The overall impact of mobile sources due implementation of the control measures has been considered less than significant for all pollutants.
- Secondary Emissions from Increased Use of Fuels due to Reduction in Fuel Economy: The reduction in fuel economy is expected to be about one percent for the affected sources so a potential increase in fuel use could occur. However, the overall focus of the 2012 AQMP is to reduce PM2.5 and ozone emissions, which is primarily driven by increasing use of cleaner fuels. Therefore, the impact of fuel economy is expected to be less than significant.
- Secondary Emissions from Miscellaneous Sources: The impacts of the control measures on secondary emissions from miscellaneous sources were determined to be less than significant.
- Non-Criteria Pollutants: Electrification may cause greater emissions of benzene, aldehydes, metals, and polynuclear aromatic hydrocarbons from fuel-based power generating facilities. However, if the process being electrified was previously powered by direct combustion of fossil fuels, then electrification may result in an overall decrease in toxic emissions. No significant secondary air quality impacts were identified from non-criteria pollutants, so no mitigation measures are required.
- Global Warming and Ozone Depletion: The 2012 AQMP is expected to have a net effect of reducing emissions of compounds that contribute to global warming and ozone depletion so that no significant adverse impacts are expected.

The air quality impacts associated with approximately 23 ozone control measures (see Table 4.2-1 in this Final Program EIR) were evaluated and determined to be less than significant for secondary emissions from increased electricity demand, control of stationary sources, change in us of lower VOC materials, mobile sources, increase us of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone depletion.

6.5.2.2.5 Project-specific and Cumulative Impacts Conclusion

Based upon the above conclusions, the 2012 AQMP PM2.5 and ozone control measures have the potential to generate significant adverse project-specific construction CO and PM10 air quality impacts. In spite of identifying eight construction air quality mitigation measures, project-specific construction CO and PM10 air quality impacts would remain significant.

With regard to project-specific secondary operational air quality impacts, a number of different types of operational air quality impacts from both 2012 AQMP PM2.5 and ozone control measures were identified and analyzed. Based on the analysis of operational air quality impacts in Subchapter 4.2, operational air quality impacts were concluded to be less than significant. Since, anticipated project-specific construction CO and PM10 impacts from the 2012 AQMP are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific air quality impacts from the 2012 AQMP were evaluated in connection with air quality impacts from SCAG's 2012-2035 RTP/SCS. Further, it was concluded that construction CO and PM10 impacts from the 2012 AQMP would not contribute to significant adverse cumulative air quality impacts from the 2012-2035 RTP/SCS. Since construction CO and PM10 impacts from the 2012 AQMP are cumulatively considerable and contribute to cumulative air quality impacts generated by the 2012-2035 RTP/SCS, cumulative construction air quality impacts from the 2012 AQMP are concluded to be significant.

Alternatively, since anticipated project-specific operational air quality impacts from the 2012 AQMP are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project specific operational air quality impacts would be less than those generated by the 2012 AQMP, the 2012 AQMP would also not contribute to significant adverse cumulative operational air quality impacts generated by the 2012-2035 RTP/SCS. Since project-specific operational air quality impacts from the 2012 AQMP are not cumulatively considerable, cumulative operational air quality impacts from the 2012 AQMP are not significant.

6.5.2.3 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final Program EIR, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. The only remaining control measures are the black box measures. Since the 2007 AQMP now includes only black box measures, environmental impacts for Alternative 1 will focus only on potential impacts identified for the black box measures. The following subsections analyze potential direct air quality impacts from Alternative 1 and compare them to direct air quality impacts from the 2012 AQMP. After the direct air quality analysis, subsections include an analysis of potential secondary air quality impacts from implementing Alternative 1 are described and impacts are compared to the 2012 AQMP. For the complete analysis of direct and secondary air quality impacts from the 2012 AQMP, refer to Subchapter 4.2 – Air Quality.

6.5.2.3.1 Direct Air Quality Impacts – PM2.5 Control Measures

It is expected that air quality will continue to improve under Alternative 1 because of the adoption and implementation by the SCAQMD and CARB of short- and mid-term control measures with future compliance dates. As shown in Table 6-7, which shows the average annual day inventories for demonstrating attainment of the federal 24-hour PM2.5 standard, Alternative 1 would not achieve the federal 24-hour PM2.5 standard until 2019, whereas it is expected that the 2012 AQMP would achieve the federal 24-hour PM2.5 standard by the year 2014, as required by federal law.

The 2012 AQMP control strategy targets directly emitted PM2.5, as is evident in the remaining 58 tons per day PM2.5 emissions inventory in the attainment year 2014 compared to the 70 tons per day PM2.5 emissions inventory in the attainment year 2019 for Alternative 1. Although the remaining PM2.5 emissions inventory for the 2012 AQMP appear to be substantially less than the remaining PM2.5 emissions inventory for Alternative 1, both inventories attain the federal 24-hour PM2.5 standard. To understand how such different results could both demonstrate attainment it is necessary to view pollutant emissions in NOx equivalents.

TABLE 6-7

Alternative 1 – PM2.5 Remaining Inventory [a] (Tons/Day)

	POLLUTANT				
SOURCE CATEGORY	**VOC**	**NOx**	**CO**	**SOx**	**PM2.5**
Baseline Year 2008 Average Annual Day (tpd)					
Total Stationary Sources	257	92	137	14	48
Total Mobile Sources	336	666	2,744	40	32
Total	**593**	**758**	**2,881**	**54**	**80**
Year 2014 – Alternative 1 Average Annual Day (tpd) [b]					
Total Stationary Sources	234	77 ~~3~~	164	12	50
Total Mobile Sources	217	429	1,931	6 ~~7~~	20
Total	**451**	**506 ~~2~~**	**2,095**	**18 ~~9~~**	**70**
Year 2014 – 2012 AQMP Average Annual Day (tpd) [c]					
Total Stationary Sources	234	77 ~~1~~	164	12	38
Total Mobile Sources	217	414 ~~29~~	1,931	6 ~~7~~	20
Total	**451**	**491 ~~500~~**	**2,095**	**18 ~~9~~**	**58**

TABLE 6-7 Concluded)

Alternative 1 – PM2.5 Remaining Inventory [a] (Tons/Day)

	POLLUTANT				
SOURCE CATEGORY	**VOC**	**NOx**	**CO**	**SOx**	**PM2.5**
Year 2019 – Alternative 1 Average Annual Day (tpd) [c]					
Total Stationary Sources	245	74	165	11	52
Total Mobile Sources	170	331	1,551	7	18
Total	**415**	**405**	**1,716**	**18**	**70**
Year 2019 – 2012 AQMP Average Annual Day (tpd)					
Total Stationary Sources	239	~~6~~ 72	165	11	40
Total Mobile Sources	170	331 ~~0~~	1,151	7	18
Total	**409**	**403 ~~397~~**	**1,716**	**18**	**58**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Does **not** demonstrate attainment of the federal 24-hour PM2.5 standard.

[c] Demonstrates attainment of the federal 24-hour PM2.5 standard.

PM2.5 has five major precursors that contribute to the development of the ambient aerosol including ammonia, NOx, SOx, VOC, and directly emitted PM2.5. For this reason it is useful to weigh the value of the precursor emissions reductions (on a per ton basis) to microgram per cubic meter improvements in ambient PM2.5 levels. The 2012 AQMP CMAQ simulations determined that VOC emissions reductions have the lowest return in terms of micrograms reduced per ton reduction, one-half of the benefit of NOx reductions. SOx emissions were shown to be about six times more effective than NOx reductions, while directly emitted PM2.5 reductions were shown to be approximately 14 times more effective than NOx reductions. Applying these weighting factors to the VOC, NOx, SOx, and directly emitted PM2.5 inventory emissions provides NOx equivalents, which can then be converted to concentrations in micrograms per cubic meter ($\mu g/m^3$).

Table 6-8 shows NOx equivalent emissions for each pollutant and total NOx equivalent emissions from Alternative 1 compared to the 2012 AQMP for the 24-hour PM2.5 attainment years, 2019 and 2014, respectively. Table 6-8 also shows the corresponding PM2.5 concentrations. As can be seen in the table, the PM2.5 concentration in the 2019 attainment year for Alternative 1 is close to the PM2.5 concentration in 2014 attainment year for the 2012 AQMP and both demonstrate attainment of the federal 24-hour PM2.5 standard.

The 2012 AQMP control strategy targets directly emitted PM2.5, as is evident in the 58 tons per day of remaining PM2.5 emissions from the 2012 AQMP in the year 2014 compared with 70 tons per day of remaining PM2.5 emissions in the year 2019 for Alternative 1. Attainment of the federal 24-hour PM2.5 standard by the year 2019 is primarily due to reductions in precursor pollutant emissions that form secondary particles rather than directly emitted PM. It is important to note that a greater portion of fine particles is produced through a series of chemical reaction that involves precursor such as NOx, VOCs, SOx and ammonia.

TABLE 6-8

NOx Equivalent Emissions [a] Comparison Between
Alternative 1 and the 2012 AQMP (Tons/Day)

	POLLUTANT						PM2.5 CONCENTRATION
	VOC	NOx	CO [b]	SOx	PM2.5	Total [c]	
Year 2019 – Alternative 1 Attainment (tpd) [c]							
Total Remaining Inventory	415	405 ~~0~~	1,716	18	70		
NOx Equivalents	195	405 ~~0~~	--	100	998	1,698 ~~3~~	35.4 µg/m^3
Year 2014 – 2012 AQMP Attainment (tpd) [c]							
Total Remaining Inventory	451	491 ~~500~~	2,095	18 ~~9~~	58		
NOx Equivalents	212	491 ~~500~~	--	108 ~~6~~	827	1,638 ~~45~~	34.2 µg/m^3

[a] This table shows remaining emissions, not emission reductions.
[b] CO does not contribute to PM2.5 formation, so it does not have a NOx equivalent value.
[c] Only emissions representing NOx equivalents are added together because these are all ratios relative to NOx emissions.

6.5.2.3.2 Direct Air Quality Impacts – Ozone Control Measures

Because the 2012 AQMP is a PM2.5 AQMP as required by the CAA, all emission reductions are based on PM2.5 control measures. The 2012 AQMP also includes ozone control measures to continue making expeditious progress towards achieving the federal one-hour and eight-hour ozone standards, but any emission reductions from these measures were not included in the analysis of direct air quality impacts.

Because most of the remaining "black box" control measures in the 2007 AQMP would regulate mobile sources, both on-road and off-road, in the future it is assumed that, similar to the CAA §182 (e)(5) mobile source measures in the 2012 AQMP, their primary objective is to make expeditious progress in attaining the federal one-hour and eight-hour ozone standards. However, the black box control measures in the 2007 consisted of general concepts and no emissions reductions were associated with them. The analysis of direct air quality impacts from Alternative 1 in Subsection 6.5.2.3.2 does not include any emission reductions from ozone control measures. As shown in Table 6-9, Alternative 1 would continue to make progress towards attaining the federal one-hour and eight-hour ozone standards, however, progress would not be as great as it would be under the 2012 AQMP.

6.5.2.3.3 Secondary Air Quality Impacts – PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason, Alternative 1 is not expected to create any secondary construction or operational air quality impacts from PM2.5 control measures.

TABLE 6-9

Alternative 1 – Remaining Emission Inventory [a] for Ozone Attainment Evaluation (Tons/Day)

	POLLUTANT	
SOURCE CATEGORY	**VOC**	**NOx**
Baseline Year 2008 Summer Planning Inventory (tpd)		
Total Stationary Sources	264	87
Total Mobile Sources	375	634
Total	**639**	**721**
Year 2023 – Alternative 1 Summer Planning Inventory (tpd)		
Total Stationary Sources	261	70 ~~63~~
Total Mobile Sources	177	249 ~~50~~
Total	**438**	**319 ~~3~~**
Year 2023 – 2012 AQMP Summer Planning Inventory (tpd)		
Total Stationary Sources	254	66 ~~0~~
Total Mobile Sources	177	227
Total	**431**	**293 ~~87~~**
Year 2023 – Ozone Attainment Inventory (tpd)		
Total Carrying Capacity: 8-Hr standard [b]	**420**	**114**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Inventory necessary to achieve 80 ppb to attain the federal eight-hour ozone standard by 2023.

6.5.2.3.4 Secondary Air Quality Impacts – Ozone Control Measures

Potential impacts from adopting the 2007 AQMP were evaluated in the 2007 Program EIR. The 2007 Program EIR included an analysis of secondary air quality impacts from all control measures, including black box control measures. As noted in Subsection 6.4.1, both SCAQMD and CARB have achieved their 2007 AQMP short-term emission reduction targets, so the 2007 AQMP does not contain any remaining short-term stationary source or mobile source control measures the previously were identified as contributing to secondary air quality impacts. As a result, consistent with the assumption that significance determinations from the 2007 Program EIR continue to apply, it is concluded that Alternative 1 has the potential to generate potential secondary air quality impacts as shown in Table 6-10 and described in the following paragraphs.

TABLE 6-10 [a]

Environmental Impacts Identified for 2007 AQMP Black Box Measures

CONTROL MEASURE SOURCE CATEGORY	AIR QUALITY	ENERGY	HAZARDS AND HAZARDOUS MATERIALS	HYDROLOGY AND WATER QUALITY	SOLID AND HAZARDOUS ~~MATERIALS~~WASTE
Light Duty Vehicles (SCLTM-01A)	None identified.	1. Potential increase in electricity demand. **(NS)**	None identified.	None identified.	None identified.
On-Road Heavy Duty Vehicles (SCLTM-01B)	None identified.	1. Potential increase in electricity demand. **(NS)**	None identified.	None identified.	1. Potential increase in solid waste due to accelerated vehicle replacement. **(NS)**
Off-Road Vehicles (SCLTM-02)	1. Decreased engine efficiency could reduce fuel economy and increase emissions. **(NS)** 2. Potential for passive filters to emit higher levels of NO_2. **(NS)**	1. Potential increase in electricity demand. **(NS)**	1. SCR to control NOx could result in ammonia hazard impacts. **(NS)**	1. Potential impact on water demand and water quality. **(NS)** 2. Alternative formulations and additives can readily dissolve in water and impact ground and surface water. **(NS)**	1. Potential increase in solid waste due to accelerated vehicle replacement. **(NS)**
Consumer Products (SCLTM-03)	1. Increased air toxics emissions from products formulated with hazardous materials. **(NS)**	None identified.	1. Potential exposure to toxic air contaminant; flammability of reformulated material. **(NS)**	1. Potential increased use of water based formulations. **(NS)**	None identified.

[a] The topics of aesthetics, land use and planning, noise, and transportation and traffic were concluded to be less than significant in the NOP/IS for the 2007 AQMP and, therefore, were not further analyzed in the 2007 Program EIR.

TABLE 6-10 [a] (Concluded)

Environmental Impacts Identified for 2007 AQMP Black Box Measures

SOURCE CATEGORY	AIR QUALITY	ENERGY	HAZARDS AND HAZARDOUS MATERIALS	HYDROLOGY AND WATER QUALITY	SOLID AND HAZARDOUS ~~MATERIALS~~WASTE
Fuels	1. Construction impacts at refineries. **(S)** 2. Increase emissions at refineries to produce alt fuels. **(NS)**	None identified.	1. The use of alternative fuels and fuel additives can result in hazard impacts. **(NS)** 2. Production of alternative fuels could increase hazards at refineries. **(S)**	None identified.	None identified.
Marine Vessels	None identified.	None identified.	None identified.	None identified.	None identified.
Locomotives	None identified.	None identified.	1. SCR to control NOx could result in ammonia hazard impacts. **(NS)**	None identified	None identified.
Pleasure Craft	None identified.	None identified.	None identified.	None identified.	None identified.
Aircraft	None identified.	None identified.	None identified.	None identified	None identified.
Renewable Energy	None identified.	None identified.	None identified.	None identified.	None identified.
AB32 Implementation	None identified.	None identified.	None identified.	None identified.	None identified.

[a] The topics of aesthetics, land use and planning, noise, and transportation and traffic were concluded to be less than significant in the NOP/IS for the 2007 AQMP and, therefore, were not further analyzed in the 2007 Program EIR.

Construction: Of the remaining black box measures, the Fuels control measure was identified as having the potential to generate significant adverse construction emissions from modifications at local refineries to produce reformulated gasoline. Phase 3 reformulated gasoline requirements were adopted by CARB in 2008, so potential construction air quality impacts from the Fuels control measure from the 2007 AQMP have already occurred. No other black box control measures were identified as having the potential to generate construction air quality impacts. Therefore, this impact is concluded to be less than significant.

Operation: Potential operational impacts (reduced engine efficiency resulting in higher emissions and passive filters increasing NOx emissions) from Alternative 1 black box measure SCLTM-02 were identified, but concluded to be less than significant. Similarly, black box Control Measure SCLTM-03 impacts (potential toxic emissions from reformulating consumer products) were identified and also concluded to be less than significant. Finally, the Fuels control measure impacts, potential emissions from refineries produce phase 3 reformulated gasoline were identified and concluded to be less than significant.

6.5.4.3.5 Project-specific and Cumulative Impacts Conclusion

Based on the above information, implementing Alternative 1 has no PM2.5 control measures that could generate project-specific construction or operational air quality impacts. The black box ozone control measures have the potential to generate project-specific operational air quality impacts, but these were concluded to be less than significant. Overall, Alternative 1 would not generate any significant adverse project-specific air quality impacts. Potential project-specific impacts from Alternative 1 are less than project-specific air quality impacts from the 2012 AQMP, but it would achieve the 24-hour federal PM2.5 standard in 2019 instead of 2014.

Since, anticipated project-specific air impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific air quality impacts would be less than those generated by the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative air quality impacts generated by the 2012-2035 RTP/SCS. Since air quality impacts from Alternative 1 are not cumulatively considerable, air quality impacts from Alternative 1 are not significant.

6.5.2.4 Alternative 2 – PM2.5 Attainment Plan Localized PM Control in Mira Loma Area

As explained in Subsection 6.4.2, with the exception of the two episodic PM2.5 control measures for Mira Loma, CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS) and CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), and one episodic ozone Control Measure, CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. The following subsections analyze potential direct air quality impacts from Alternative 2 and compare them to direct air quality impacts from the 2012 AQMP. After the direct air quality analysis, subsections describing potential secondary air quality impacts from implementing Alternative 2 are described and compared to the 2012 AQMP. For the complete analysis of direct and secondary air quality impacts from the 2012 AQMP, refer to Subchapter 4.2 – Air Quality.

6.5.2.4.1 Direct Air Quality Impacts – PM2.5 Control Measures

The 2012 AQMP control strategy targets directly emitted PM2.5, as is evident in the 58 tons per day of remaining PM2.5 emissions from the 2012 AQMP in the attainment year 2014 compared with 64 tons per day of remaining PM2.5 emissions for Alternative 2 in the attainment year 2017 (Table 6-10). Attainment of the federal 24-hour PM2.5 standard by the year 2017 is primarily due to reductions in precursor pollutant emissions that form secondary particles rather than directly emitted PM. It is important to note that a greater portion of fine particles is produced through a series of chemical reaction that involves precursor such as NOx, VOCs, SOx and ammonia.

Table 6-12 shows NOx equivalent emissions for each pollutant and total NOx equivalent emissions from Alternative 2 compared to the 2012 AQMP for the 24-hour PM2.5 attainment years, 2017 and 2014, respectively. Table 6-12 also shows the corresponding PM2.5 concentrations. As can be seen in the table, the PM2.5 concentration in the 2017 attainment year for Alternative 2 is close to the PM2.5 concentration in 2014 attainment year for the 2012 AQMP and both demonstrate attainment of the federal 24-hour PM2.5 standard.

TABLE 6-11

Alternative 2 – PM2.5 Remaining Inventory (Tons/Day) [a]

	POLLUTANT				
SOURCE CATEGORY	**VOC**	**NOx**	**CO**	**SOx**	**PM2.5**
Baseline Year 2008 Average Annual Day (tpd)					
Total Stationary Sources	257	92	137	14	48
Total Mobile Sources	336	666	2,744	40	32
Total	**593**	**758**	**2,881**	**54**	**80**
Year 2014 – Alternative 2 Average Annual Day (tpd) [b]					
Total Stationary Sources	234	73 ~~1~~	164	12	43
Total Mobile Sources	217	429	1,931	7	20
Total	**451**	**500**	**2,095**	**19**	**63**
Year 2014 – 2012 AQMP Average Annual Day (tpd) [c]					
Total Stationary Sources	234	77 ~~1~~	164	12	43 ~~8~~
Total Mobile Sources	217	429	1931	6 ~~7~~	20
Total	**451**	**506 ~~0~~**	**2,095**	**18 ~~9~~**	**63 ~~58~~**
Year 2017 – Alternative 2 Average Annual Day (tpd) [c]					
Total Stationary Sources	237	74 ~~68~~	165	11	44
Total Mobile Sources	188	377	1,702	7	19
Total	**425**	**451 ~~45~~**	**1,867**	**18**	**63**

TABLE 6-11 (Concluded)

Alternative 2 – PM2.5 Remaining Inventory (Tons/Day) [a]

	POLLUTANT				
SOURCE CATEGORY	**VOC**	**NOx**	**CO**	**SOx**	**PM2.5**
Year 2017 – 2012 AQMP Average Annual Day (tpd) [d]					
Total Stationary Sources	237	74 ~~68~~	165	11	39
Total Mobile Sources	188	377	1702	7	19
Total	**425**	**451 ~~45~~**	**1,867**	**18**	**58**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Does **not** demonstrate attainment of the federal 24-hour PM2.5 standard.

[c] Demonstrates attainment of the federal 24-hour PM2.5 standard.

[d] Continues to demonstrate attainment of the federal 24-hour PM2.5 standard.

TABLE 6-12

NOx Equivalent Emissions [a] Comparison Between Alternative 2 and the 2012 AQMP (Tons/Day)

	POLLUTANT						PM2.5 CONCENTRATION
	VOC	**NOx**	**CO [b]**	**SOx**	**PM2.5**	**Total [c]**	
Year 2017 – Alternative 2 Attainment (tpd) [c]							
Total Remaining Inventory	425	451 ~~45~~	1,867	18	63		
NOx Equivalents	200	451 ~~45~~	--	100	898	1,649 ~~3~~	34.5 µg/m³
Year 2014 – 2012 AQMP Attainment (tpd) [c]							
Total Remaining Inventory	451	491 ~~500~~	2,095	18 ~~9~~	58		
NOx Equivalents	212	491 ~~500~~	--	108 ~~6~~	827	1,638 ~~45~~	34.2 µg/m³

[a] This table shows remaining emissions, not emission reductions.

[b] CO does not contribute to PM2.5 formation, so it does not have a NOx equivalent value.

[c] Only emissions representing NOx equivalents are added together because these are all ratios relative to NOx emissions.

6.5.2.4.2 Direct Air Quality Impacts – Ozone Control Measures

Because the 2012 AQMP also includes control measures for making expeditious progress in attaining the federal one-hour and eight-hour ozone standards by the year 2023, a comparison of the summer planning inventories for ozone was also performed. As shown in Table 6-13, Alternative 2 would continue to make progress towards attaining the federal one-hour and eight-hour ozone standards to the same extent as the 2012 AQMP because

Alternative 2 contains all of the same control measures pertaining to reducing ozone concentrations as the 2012 AQMP.

6.5.2.4.3 Secondary Air Quality Impacts – PM2.5 Control Measures

Construction: The Alternative 2 PM2.5 control measures were evaluated and it was concluded that they would not contribute to construction air quality impacts. However, because all remaining PM2.5 control measures in Alternative 2 are identical to those in the 2012 AQMP, the same construction activities and associated construction emissions would occur. It was concluded that the 2012 AQMP PM2.5 control measures have the potential to contribute to significant adverse secondary air quality impacts as the increase in the construction emission inventories for CO and PM10 from the baseline to the year 2023 would increase in an amount that would exceed the applicable construction air quality significance thresholds of 550 and 150 pounds per day, respectively (refer to Table 4.2-4).

The same PM2.5 control measure construction air quality conclusion from the 2012 AQMP applies to Alternative 2. Similarly, because future construction air quality impacts from Alternative 2 were concluded to be significant, eight mitigation measures were identified to reduce potentially significant CO and PM10 construction air quality impacts. In spite of implementing these eight construction air quality mitigation measures, CO and PM10 construction air quality impacts from Alternative 2 would remain significant and equivalent to the 2012 AQMP.

TABLE 6-13

Alternative 2 – Remaining Emission Inventory for Ozone Attainment Evaluation [a]

	POLLUTANT	
SOURCE CATEGORY	**VOC**	**NOx**
Baseline Year 2008 Summer Planning Inventory (tpd)		
Total Stationary Sources	264	87
Total Mobile Sources	375	634
Total	**639**	**721**
Alternative 2 Year 2023 Summer Planning Inventory (tpd)		
Total Stationary Sources	254	60
Total Mobile Sources	177	227
Total	**431**	**293 ~~87~~**
2012 AQMP Year 2023 Summer Planning Inventory (tpd)		
Total Stationary Sources	254	60
Total Mobile Sources	177	227
Total	**431**	**293 ~~87~~**
Year 2023 – Ozone Attainment Inventory (tpd)		
Total Carrying Capacity: 8-Hr standard [b]	**420**	**114**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Inventory necessary to achieve 80 ppb to attain the federal eight-hour ozone standard by 2023.

Operation: Alternative 2 PM2.5 measures CMALT-2B (similar to 2012 AQMP PM2.5 Control Measure BCM-01) and CMALT-2C (the same as 2012 AQMP PM2.5 Control Measure BCM-04) were evaluated and it was concluded that they have the potential to generate criteria pollutant and GHG emissions from combustion sources. Because all remaining PM2.5 control measures in Alternative 2 are identical to those in the 2012 AQMP, the same operation activities and associated operation emissions would occur. The analysis concluded, however, that secondary operational emissions from increased electricity demand, control of stationary sources, coatings and solvents formulated with low VOC materials, use of alternative fuels in mobile sources, increase us of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone depletion as a result of implementing the 2012 AQMP would be less than significant. Because Alternative 2 Control Measure CMALT-2B (similar to 2012 AQMP PM2.5 Control Measure BCM-01) would only apply to the Mira Loma area, the magnitude of the criteria pollutant and GHG emissions would be less than the operation impacts from 2012 AQMP Control Measure BCM-01. Consequently, operational air quality impacts from Alternative 2 would be less than significant and slightly less than operational air quality impacts from the 2012 AQMP.

6.5.2.4.4 Secondary Air Quality Impacts – Ozone Control Measures

Construction: Alternative 2 Control Measure CMALT-2A (similar to 2012 AQMP Control Measure ONRD-04) was evaluated and it was concluded that it would not contribute to construction air quality impacts. Because all remaining ozone control measures in Alternative 2 are identical to those in the 2012 AQMP, the same construction activities and associated construction emissions would occur. It was concluded that the 2012 AQMP ozone control measures have the potential to contribute to significant adverse secondary air quality impacts as the increase in the construction emission inventories for CO and PM10 from the baseline to the year 2023 would increase in an amount that would exceed the applicable construction air quality significance thresholds of 550 and 150 pounds per day, respectively (refer to Table 4.2-4). This same conclusion applies to Alternative 2. Similarly, because future construction air quality impacts from Alternative 2 were concluded to be significant, eight mitigation measures were identified to reduce potentially significant CO and PM10 construction air quality impacts. In spite of implementing these eight construction air quality mitigation measures, CO and PM10 construction air quality impacts from Alternative 2 would remain significant and equivalent to the 2012 AQMP.

Operation: Alternative 2 Control Measure CMALT-2A (similar to 2012 AQMP Control Measure ONRD-04) was evaluated and it could potentially generate criteria pollutant, toxic air pollutant and GHG emissions from and electricity generation. Further, it has the potential generate emissions from demolition of retired vehicles. Because all remaining ozone control measures in Alternative 2 are identical to those in the 2012 AQMP, the same operation activities and associated construction emissions would occur. The analysis concluded, however, that secondary operational emissions from increased electricity demand, control of stationary sources, coatings and solvents formulated with low VOC materials, use of alternative fuels in mobile sources, increase us of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone depletion as a result of implementing the 2012 AQMP would be less than significant. Because Alternative 2 Control Measure CMALT-2B (similar to 2012 AQMP PM2.5 Control Measure BCM-01) would only apply to the Mira Loma area, the magnitude of the criteria pollutant and GHG emissions would be less than the operation impacts from 2012 AQMP Control Measure BCM-01.

6.5.2.4.3 Project-specific and Cumulative Impacts Conclusion

Although the three episodic control measures for the Mira Loma area do not contribute to construction air quality impacts, all other control measures in Alternative 2 are identical to the control measures in the 2012 AQMP. Consequently, like the 2012 AQMP, Alternative 2 PM2.5 and ozone control measures have the potential to generate significant adverse project-specific construction CO and PM10 air quality impacts. In spite of identifying eight construction air quality mitigation measures, project-specific construction CO and PM10 air quality impacts would remain significant.

With regard to project-specific secondary operational air quality impacts, it was concluded that the three episodic control measures for the Mira Loma area contribute to operational air quality impacts. As already noted, all remaining PM2.5 and ozone control measures in Alternative 2 are identical to the 2012 AQMP PM2.5 and ozone control measures. As a result, operational air quality impacts from Alternative 2 were concluded to be less than significant. Because Alternative 2 Control Measures CMALT-2A (similar to 2012 AQMP PM2.5 control measure ONRD-04) and CMALT-2B (similar to 2012 AQMP PM2.5 Control Measure BCM-01) would only apply to the Mira Loma area, the magnitude of the criteria pollutant and GHG emissions would be less than the operation impacts from 2012 AQMP Control Measures ONRD-04 and BCM-01, respectively.

Since anticipated project-specific construction CO and PM10 air quality impacts from Alternative 2 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Since project-specific construction CO and PM10 air quality impacts from Alternative 2 are cumulatively considerable, cumulative project-specific construction CO and PM10 air quality impacts from Alternative 2 are concluded to be significant. Further, since project-specific construction air quality impacts would be significant and equivalent to those generated by the 2012 AQMP, Alternative 2 would also contribute to significant adverse cumulative air quality impacts generated by the 2012-2035 RTP/SCS. No other construction air quality mitigation measures were identified that reduce cumulative construction CO and PM10 air quality impacts to less than significant.

Alternatively, since anticipated project-specific operational air quality impacts from the 2012 AQMP are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Since project-specific operational air quality impacts would be approximately equivalent to those generated by the 2012 AQMP, Alternative 2 would also not contribute to significant adverse cumulative operational air quality impacts generated by the 2012-2035 RTP/SCS. Since project-specific construction CO and PM10 air quality impacts from the 2012 AQMP are not cumulatively considerable, cumulative operational air quality impacts from the 2012 AQMP are not significant.

6.5.2.5 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except for 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. The following subsections analyze potential direct air quality impacts from Alternative 3 and compare them to direct air quality impacts from the 2012 AQMP. After the direct air quality analysis, subsections describing potential secondary air quality impacts from implementing Alternative 3 are described and compared to the 2012 AQMP. For the complete analysis of direct and secondary air quality impacts from the 2012 AQMP, refer to Subchapter 4.2 – Air Quality.

6.5.2.5.1 Direct Air Quality Impacts – PM2.5 Control Measures

The 2012 AQMP control strategy targets directly emitted PM2.5, as is evident in the 58 tons per day of remaining PM2.5 emissions from the 2012 AQMP in the attainment year 2014 compared with 65 tons per day of remaining PM2.5 emissions for Alternative 3 in the attainment year 2017 (Table 6-14). Attainment of the federal 24-hour PM2.5 standard by the year 2017 is primarily due to reductions in precursor pollutant emissions that form secondary particles rather than directly emitted PM. It is important to note that a greater portion of fine particles is produced through a series of chemical reaction that involves precursor such as NOx, VOCs, SOx and ammonia.

TABLE 6-14

Alternative 3 – PM2.5 Remaining Inventory (Tons/Day) [a]

	POLLUTANT				
SOURCE CATEGORY	**VOC**	**NOx**	**CO**	**SOx**	**PM2.5**
Baseline Year 2008 Average Annual Day (tpd)					
Total Stationary Sources	257	92	137	14	48
Total Mobile Sources	336	666	2,744	40	32
Total	**593**	**758**	**2,881**	**54**	**80**
Year 2014 – Alternative 3 Average Annual Day (tpd) [b]					
Total Stationary Sources	234	77 ~~1~~	164	12	45
Total Mobile Sources	217	429	1,931	6 ~~7~~	20
Total	**451**	**506 ~~0~~**	**2,095**	**18 ~~9~~**	**65**
Year 2014 – 2012 AQMP Average Annual Day (tpd) [c]					
Total Stationary Sources	234	77 ~~1~~	164	12	38
Total Mobile Sources	217	414 ~~29~~	1,931	6 ~~7~~	20
Total	**451**	**491 ~~500~~**	**2,095**	**18 ~~9~~**	**58**

TABLE 6-14 (Concluded)

Alternative 3 – PM2.5 Remaining Inventory (Tons/Day) [a]

	POLLUTANT				
SOURCE CATEGORY	**VOC**	**NOx**	**CO**	**SOx**	**PM2.5**
Year 2017 – Alternative 3 Average Annual Day (tpd) [c]					
Total Stationary Sources	234	72 ~~66~~	114	11	42
Total Mobile Sources	186	344	1,702	7	19
Total	**420**	**416 ~~0~~**	**1,816**	**18**	**61**
Year 2017 – 2012 AQMP Average Annual Day (tpd) [d]					
Total Stationary Sources	239 ~~7~~	72 ~~68~~	165	11	39
Total Mobile Sources	170 ~~88~~	331 ~~77~~	1,551 ~~702~~	7	19
Total	**409 ~~25~~**	**403 ~~45~~**	**1,716 ~~867~~**	**18**	**58**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Does **not** demonstrate attainment of the federal 24-hour PM2.5 standard.

[c] Demonstrates attainment of the federal 24-hour PM2.5 standard.

[d] Continues to demonstrate attainment of the federal 24-hour PM2.5 standard.

Table 6-15 shows NOx equivalent emissions for each pollutant and total NOx equivalent emissions from Alternative 3 compared to the 2012 AQMP for the 24-hour PM2.5 attainment years, 2017 and 2014, respectively. Table 6-15 also shows the corresponding PM2.5 concentrations. As can be seen in the table, the PM2.5 concentration in the 2017 attainment year for Alternative 3 is close to the PM2.5 concentration in 2014 attainment year for the 2012 AQMP and both demonstrate attainment of the federal 24-hour PM2.5 standard.

6.5.2.5.2 Direct Air Quality Impacts – Ozone Control Measures

Because the 2012 AQMP also includes control measures for making expeditious progress in attaining the federal one-hour and eight-hour ozone standards by the year 2023, a comparison of the summer planning inventories for ozone was also performed. As shown in Table 6-16, Alternative 3 would continue to make progress towards attaining the federal one-hour and eight-hour ozone standards to the same extent as the 2012 AQMP because Alternative 3 contains all of the same control measures pertaining to reducing ozone concentrations as the 2012 AQMP. Even though Alternative 3 would generate NOx emission reductions sooner, by 2023 NOx emission reductions from Alternative are expected to be equivalent to NOx emission reductions from the 2012 AQMP.

TABLE 6-15

NOx Equivalent Emissions [a] Comparison Between Alternative 3 and the 2012 AQMP (Tons/Day)

	POLLUTANT						PM2.5 CONCENTRATION
	VOC	NOx	CO [b]	SOx	PM2.5	Total [c]	
Year 2017 – Alternative 3 Attainment (tpd) [c]							
Total Remaining Inventory	420	416 ~~0~~	1,816	18	61		
NOx Equivalents	197	416 ~~0~~	--	100	870	1,583 ~~77~~	35.0 µg/m^3
Year 2014 – 2012 AQMP Attainment (tpd) [c]							
Total Remaining Inventory	451	491 ~~500~~	2,095	18 ~~9~~	58		
NOx Equivalents	212	491 ~~500~~	--	108 ~~6~~	827	1,638 ~~45~~	34.2 µg/m^3

[a] This table shows remaining emissions, not emission reductions.

[b] CO does not contribute to PM2.5 formation, so it does not have a NOx equivalent value.

[c] Only emissions representing NOx equivalents are added together because these are all ratios relative to NOx emissions.

TABLE 6-16

Alternative 3 – Remaining Emission Inventory for Ozone Attainment Evaluation [a]

	POLLUTANT	
SOURCE CATEGORY	**VOC**	**NOx**
Baseline Year 2008 Summer Planning Inventory (tpd)		
Total Stationary Sources	264	87
Total Mobile Sources	375	634
Total	**639**	**721**
Year 2023 – Alternative 3 Summer Planning Inventory (tpd)		
Total Stationary Sources	254	60
Total Mobile Sources	177	227
Total	**431**	**297 ~~87~~**
Year 2023 – 2012 AQMP Summer Planning Inventory (tpd)		
Total Stationary Sources	254	66 ~~0~~
Total Mobile Sources	177	227
Total	**431**	**293 ~~87~~**
Year 2023 – Ozone Attainment Inventory (tpd)		
Total Carrying Capacity: 8-Hr standard [b]	**420**	**114**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Inventory necessary to achieve 80 ppb to attain the federal eight-hour ozone standard by 2023.

6.5.2.5.3 Secondary Air Quality Impacts – PM2.5 Control Measures

Construction: All PM2.5 control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 does not include BCM-01. PM2.5 Control Measure BCM-01 was not identified as a control measure that contributed to construction air quality impacts. Consequently, the same construction activities and associated construction emissions would occur under Alternative 3 as would occur under the 2012 AQMP. It was concluded that the 2012 AQMP PM2.5 control measures have the potential to contribute to significant adverse secondary air quality impacts as the increase in the construction emission inventories for CO and PM10 from the baseline to the year 2023 would increase in an amount that would exceed the applicable construction air quality significance thresholds of 550 and 150 pounds per day, respectively (refer to Table 4.2-4). This same conclusion applies to Alternative 3. Similarly, because future construction air quality impacts from Alternative 3 were concluded to be significant, eight mitigation measures were identified to reduce potentially significant CO and PM10 construction air quality impacts. In spite of implementing these eight construction air quality mitigation measures, CO and PM10 construction air quality impacts from Alternative 2 would remain significant and equivalent to the 2012 AQMP.

Operation: With the exception of Control Measure BCM-01, Alternative 3 includes all of the same control measures as the 2012 AQMP, so the same operation activities and associated operation emissions would occur. The analysis concluded, however, that secondary operational emissions from increased electricity demand, control of stationary sources, coatings and solvents formulated with low VOC materials, use of alternative fuels in mobile sources, increase us of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone depletion as a result of implementing the 2012 AQMP would be less than significant. Because PM2.5 Control Measure BCM-01 has the potential to generate GHG emissions, but it is not included in as part of the operation impacts from Alternative 3, operational air quality impacts from Alternative 3 would be less than significant and slightly less than operation impacts from the 2012 AQMP.

6.5.2.5.4 Secondary Air Quality Impacts – Ozone Control Measures

Construction: All ozone control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 ozone Control Measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (750 trucks per year that would be diesel or diesel-hybrids that comply with the year 2010 exhaust emission standards and 250 trucks per year that would use CNG engines for a total of 1,000 trucks per year). Similarly, Alternative 3 OFFRD-01 could result in a total of 19,344 additional repowered or replaced vehicles from the year 2014 through 2017. However, neither of these control measures was identified as contributing to construction air quality impacts. In spite of this conclusion, since all remaining ozone control measures in Alternative 3 are also included in the 2012 AQMP, Alternative 3 has the potential to contribute to significant adverse secondary air quality impacts from increased construction emission inventories for CO and PM10 from the baseline to the year 2023 in amounts that would exceed the applicable construction air quality significance thresholds of 550 and 150 pounds per day, respectively (refer to Table 4.2-4). This same conclusion applies to Alternative 3. Similarly, because future construction air quality impacts from Alternative 3 were concluded to be significant, eight mitigation measures were identified to reduce potentially significant CO and PM10 construction air quality impacts. In spite of implementing these eight construction air quality mitigation measures, CO and PM10 construction air quality impacts from Alternative 3 would remain significant and equivalent to the 2012 AQMP.

Operation: All ozone control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 ozone Control Measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (1,000 trucks per year, 250 trucks per would comply with the 2010 on-road vehicle exhaust requirements using CNG engines and the rest would be diesel or diesel hybrid). The analysis of Alternative 3 ozone Control Measure ONRD-03 indicated that it has the potential to generate additional criteria pollutant, toxic air pollutant and GHG emissions from and electricity generation beyond those that would occur under the 2012 AQMP.

The increase in electricity demand from ozone Control Measure ONRD-03 would be twice that of the 2012 AQMP (see Table 4.2-5 of this Final Program EIR). However, this increase would not result in exceedances of any of the applicable regional significance thresholds.

Power generating facilities are subject to AB-32 and would be required to reduce GHG emissions by 2020. Therefore, the additional energy demand from Alternative 3 Control Measure ONRD-03 would be expected to increase, but is not expected to generate significant emission impacts.

Although Alternative 3 Control Measure ONRD-01 could increase demand for electricity, thus, potentially increasing GHG emissions from electric utilities, increased GHG emissions would be offset by reductions in GHG emissions from less polluting trucks. Because alternative 3 ozone Control Measure ONRD-03 would result in twice as many cleaner, less polluting heavy-duty trucks as the 2012 AQMP, GHG reduction benefits would be greater.

Similarly, Alternative 3 OFFRD-01 could result in a total of 19,344 additional repowered or replaced vehicles from the year 2014 through 2017. Alternative 3 ozone Control Measure ONRD-03 has the potential double the increase in the demand for alternative fuels compared to the 2012 AQMP. The reduction in fuel economy associated with use of alternative fuels expected to be greater than the 2012 AQMP, which is one percent for the affected sources so a potential increase in fuel use could occur. However, the overall focus of the 2012 AQMP is to reduce PM2.5 and ozone emissions, which is primarily driven by increasing use of cleaner fuels. Therefore, the impact of fuel economy is expected to be less than significant, but greater than the 2012 AQMP.

6.5.2.5.5 Project-specific and Cumulative Impacts Conclusion

Based upon the above conclusions, Alternative 3 PM2.5 and ozone control measures have the potential to generate significant adverse project-specific construction CO and PM10 air quality impacts equivalent to those from the 2012 AQMP. In spite of identifying eight construction air quality mitigation measures, project-specific construction CO and PM10 air quality impacts would remain significant.

Since anticipated project-specific construction CO and PM10 air quality impacts from the 2012 AQMP are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific construction air quality impacts would be approximately equivalent to those generated by the 2012 AQMP, Alternative 3 would also contribute to significant adverse cumulative construction air quality impacts generated by the 2012-2035 RTP/SCS. Since project-specific construction CO and PM10 air quality impacts from the 2012 AQMP are cumulatively considerable, cumulative project-specific construction CO and PM10 air quality impacts from the 2012 AQMP are concluded to be significant. No other construction air quality mitigation measures were identified that reduce cumulative construction CO and PM10 air quality impacts to less than significant.

With regard to project-specific secondary operational air quality impacts, a number of different types of operational air quality impacts from Alternative 3 PM2.5 and ozone control measures were identified and analyzed. Since project-specific operational air quality impacts would be significant and greater than those generated by the 2012 AQMP, Alternative 3 would contribute to significant adverse cumulative operational air quality impacts generated by the 2012-2035 RTP/SCS. Based on the analysis of operational air quality impacts, overall operational air quality impacts were concluded to be significant and greater than the 2012 AQMP.

Since anticipated project-specific operational air quality impacts from the 2012 AQMP are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Since project-specific construction operational air quality impacts from the 2012 AQMP are cumulatively considerable, cumulative operational air quality impacts from the Alternative 3 are concluded to significant and greater than the 2012 AQMP.

6.5.2.6 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.4, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2. The following subsections analyze potential direct air quality impacts from Alternative 4 and compare them to direct air quality impacts from the 2012 AQMP. After the direct air quality analysis, subsections include an analysis of potential secondary air quality impacts from implementing Alternative 4 are described and impacts are compared to the 2012 AQMP. For the complete analysis of direct and secondary air quality impacts from the 2012 AQMP, refer to Subchapter 4.2 – Air Quality.

6.5.2.6.1 Direct Air Quality Impacts – PM2.5 Control Measures

The 2012 AQMP control strategy targets directly emitted PM2.5, as is evident in the 58 tons per day of remaining PM2.5 emissions from the 2012 AQMP in the attainment year 2014 which is the same as the remaining PM2.5 emissions for Alternative 4 in the attainment year 2014 (Table 6-17). The reason for this result is that Alternative 4 contains the same PM2.5 reduction control measures as the 2012 AQMP, so the same strategy, reducing directly emitted PM2.5, is expected to produce the same results in the year 2014 for both Alternative 4 and the 2012 AQMP.

TABLE 6-17

Alternative 4 – PM2.5 Remaining Inventory (Tons/Day) [a]

	POLLUTANT				
SOURCE CATEGORY	**VOC**	**NOx**	**CO**	**SOx**	**PM2.5**
Baseline Year 2008 Average Annual Day (tpd)					
Total Stationary Sources	257	92	137	14	48
Total Mobile Sources	336	666	2,744	40	32
Total	**593**	**758**	**2,881**	**54**	**80**
Year 2014 – Alternative 4 Average Annual Day (tpd) [b]					
Total Stationary Sources	234	77 ~~1~~	164	12	38
Total Mobile Sources	217	429	1,931	6 ~~7~~	20
Total	**451**	**506 ~~0~~**	**2,095**	**18 ~~9~~**	**58**
Year 2014 – 2012 AQMP Average Annual Day (tpd) [b]					
Total Stationary Sources	234	77 ~~1~~	164	12	38
Total Mobile Sources	217	414 ~~2~~9	1931	6 ~~7~~	20
Total	**451**	**491 ~~500~~**	**2,095**	**18 ~~9~~**	**58**
Year 2017 – Alternative 4 Average Annual Day (tpd) [c]					
Total Stationary Sources	240	74 ~~0~~	165	11	39
Total Mobile Sources	187	378 ~~7~~	1,702	7	19
Total	**427**	**452 ~~47~~**	**1,867**	**18**	**58**
Year 2017 – 2012 AQMP Average Annual Day (tpd) [c]					
Total Stationary Sources	237	74 ~~68~~	165	11	39
Total Mobile Sources	188	377	1702	7	19
Total	**425**	**451 ~~45~~**	**1,867**	**18**	**58**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Demonstrates attainment of the federal 24-hour PM2.5 standard.

[c] Continues to demonstrate attainment of the federal 24-hour PM2.5 standard.

TABLE 6-18

NOx Equivalent Emissions [a] Comparison Between Alternative 4 and the 2012 AQMP (Tons/Day)

	POLLUTANT						PM2.5 CONCENTRATION
	VOC	NOx	CO [b]	SOx	PM2.5	Total [c]	
Year 2014 – Alternative 4 Attainment (tpd) [c]							
Total Remaining Inventory	451	506 ~~0~~	2,095	18 ~~9~~	58		
NOx Equivalents	212	506 ~~0~~	--	108 ~~6~~	827	1,653 ~~45~~	34.2 µg/m^3
Year 2014 – 2012 AQMP Attainment (tpd) [c]							
Total Remaining Inventory	451	491 ~~500~~	2,095	18 ~~9~~	58		
NOx Equivalents	212	491 ~~500~~	--	108 ~~6~~	827	1,638 ~~45~~	34.2 µg/m^3

a This table shows remaining emissions, not emission reductions.

b CO does not contribute to PM2.5 formation, so it does not have a NOx equivalent value.

c Only emissions representing NOx equivalents are added together because these are all ratios relative to NOx emissions.

6.5.2.6.2 Direct Air Quality Impacts – Ozone Control Measures

Because the 2012 AQMP also includes control measures for making expeditious progress in attaining the federal one-hour and eight-hour ozone standards by the year 2023, a comparison of the summer planning inventories for ozone was also performed. As shown in Table 6-19, Alternative 4 would continue to make progress towards attaining the federal one-hour and eight-hour ozone standards, but not to the same extent as the 2012 AQMP, because Alternative 4 contains all of the same control measures pertaining to reducing ozone concentrations as the 2012 AQMP. Even though Alternative 4 would generate NOx emission reductions sooner, by 2023 NOx emission reductions from Alternative are expected to be equivalent to NOx emission reductions from the 2012 AQMP.

6.5.2.6.3 Secondary Air Quality Impacts – PM2.5 Control Measures

Construction: Because Alternative 4 includes all of the same PM2.5 control measures as the 2012 AQMP, construction impacts from Alternative 4 PM2.5 control measures would be the same as for the 2012 AQMP, as explained here. Construction air quality impacts associated with approximately seven 2012 AQMP PM2.5 control measures were identified and evaluated. It was assumed that the following types of construction activities to implement 2012 AQMP PM2.5 control measures contribute to construction activities emission inventories: 1) additional infrastructure to support electric and alternative fuel vehicles; 2) additional infrastructure for stationary source controls; and, 3) additional infrastructure to support electrification of new sources. It was concluded that these PM2.5 control measures have the potential to contribute to significant adverse secondary air quality impacts as the increase in the construction emission inventories for CO and PM10 from the baseline to the year 2023 would increase in an amount that would exceed the applicable construction air quality significance thresholds of 550 and 150 pounds per day, respectively (refer to Table 4.2-4). Because future construction air quality impacts were concluded to be significant, eight mitigation measures were identified to reduce potentially significant CO and PM10 construction air quality impacts. In spite of implementing these eight construction air quality mitigation measures, CO and PM10 construction air quality impacts would remain significant. This conclusion applies to Alternative 4.

TABLE 6-19

Alternative 4 – Remaining Emission Inventory for Ozone Attainment Evaluation [a]

	POLLUTANT	
SOURCE CATEGORY	**VOC**	**NOx**
Baseline Year 2008 Summer Planning Inventory (tpd)		
Total Stationary Sources	264	87
Total Mobile Sources	375	634
Total	**639**	**721**
Year 2023 – Alternative 4 Summer Planning Inventory (tpd)		
Total Stationary Sources	261	63
Total Mobile Sources	177	250
Total	**438**	**313**
Year 2023 – 2012 AQMP Summer Planning Inventory (tpd)		
Total Stationary Sources	254	60
Total Mobile Sources	177	227
Total	**431**	**287**
Year 2023 – Ozone Attainment Inventory (tpd)		
Total Carrying Capacity: 8-Hr standard [b]	**420**	**114**

[a] This table shows remaining emissions, not emission reductions. Remaining emission take into account emission reductions achieved or projected to be achieved from AQMP control measures and subtracted from the 2008 baseline.

[b] Inventory necessary to achieve 80 ppb to attain the federal eight-hour ozone standard by 2023.

Operation: Because Alternative 4 PM2.5 measures are identical to those in the 2007 AQMP, the same operation activities and associated operation emissions would occur. The analysis concluded, however, that secondary operational emissions from increased electricity demand, control of stationary sources, coatings and solvents formulated with low VOC materials, use of alternative fuels in mobile sources, increase us of fuels due to reduction in fuel economy, miscellaneous sources, non-criteria pollutants, and global warming and ozone depletion as a result of implementing the 2012 AQMP would be less than significant. Consequently, operational air quality impacts from Alternative 4 would be significant and equivalent to the operational air quality impacts from the 2012 AQMP.

6.5.2.2.4 *Secondary Air Quality Impacts – Ozone Control Measures*

Construction: Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2 of this Final Program EIR. As a result, construction air impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1, less than significant and, therefore, less than the 2012 AQMP.

Operation: As noted above, Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2 of this Final Program EIR. As a result, operation air impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1, less than significant.

6.5.2.6.3 *Project-specific and Cumulative Impacts Conclusion*

Based upon the above conclusions, implementing PM2.5 control measures have the potential to generate significant project-specific construction air quality impacts, while operational impacts would be less than significant. Overall air quality impacts from implementing Alternative 4 PM2.5 control measures would identical to the 2012 AQMP. No project-specific construction or operational air quality impacts were identified from implementing Alternative 4 ozone control measures. Therefore, it is presumed that Alternative 4 has the potential to generate significant adverse project-specific construction air quality impacts, which would be equivalent to the 2012 AQMP and less than significant project-specific operational air quality impacts, which would be less than project-specific impacts from the 2012 AQMP.

Since, anticipated project-specific construction air quality impacts from Alternative 4 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific construction impacts would be significant and approximately equivalent to those generated by the 2012 AQMP, Alternative 4 would contribute to significant adverse cumulative air quality impacts generated by the 2012-2035 RTP/SCS. Since construction air quality impacts from Alternative 4 are cumulatively considerable, cumulative construction air quality impacts from Alternative 4 are significant and equivalent to the 2012 AQMP.

Alternatively, since anticipated project-specific operational air quality impacts from Alternative 4 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific operational air quality impacts would be less significant and less than those generated by the 2012 AQMP, Alternative 4 would also not contribute to significant adverse cumulative operational air quality impacts generated by the 2012-2035 RTP/SCS. Since operation air quality impacts from Alternative 4 are not cumulatively considerable, cumulative operational air quality impacts from Alternative 4 are significant, but less than the 2012 AQMP.

6.5.3 Energy

The potential direct and indirect energy impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide a brief summary of potential direct and indirect energy impacts from the 2012 and evaluate potential direct and indirect energy impacts from each alternative relative to the 2012 AQMP.

6.5.3.1 Proposed Project

Potential direct and indirect energy impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis of potential energy impacts from implementing the 2012 AQMP, refer to Subchapter 4.3 - Energy.

6.5.3.1.1 PM2.5 Control Measures

As shown in Table 4.3-1, there are a number of 2012 AQMP PM2.5 control measures that have the potential to generate adverse energy impacts associated with implementing the 2012 AQMP PM2.5 control measures. Potential energy impacts from increased demand for electricity natural gas, petroleum fuels, and alternative fuels as a result of implementing 2012 PM2.5 control measures, are summarized in the following paragraph.

The potential increase in electricity and natural gas use due to implementation of 2012 AQMP PM2.5 control measures is partially associated with the potential installation of add-on control equipment. The energy impacts associated with 2012 AQMP PM2.5 control measures (see Table 4.3-1) were evaluated and determined to be less than significant for electricity, natural gas, petroleum fuels, and alternative fuels impacts.

6.5.3.1.2 Ozone Control Measures

As shown in Table 4.3-1 of this Final Program EIR, there are a number of 2012 AQMP ozone control measures that have the potential to generate adverse energy impacts associated with implementing the 2012 AQMP ozone control measures. Potential energy impacts from increased demand for electricity natural gas, petroleum fuels, and alternative fuels as a result of implementing 2012 PM2.5 control measures, are summarized in the following paragraphs.

A number of ozone control measures in the 2012 AQMP, in particular mobile source control measures, are expected to increase the demand for electricity and natural gas to fuel both on-road and off-road mobile sources as a means of complying with 2012 AQMP ozone control measures. Any increases in the use of electricity or natural gas as a combustion fuel would likely result in a concurrent decrease in tradition petroleum fuels such as gasoline and diesel. The increase in demand for electricity and natural gas associated with the ozone control measures and strategies in the 2012 AQMP is considered to be significant.

Subchapter 4.3 also included an analysis of 2012 AQMP ozone control measures that may have the potential to increase demand for alternative fuels such as hydrogen, methanol, ethanol, etc. Demand for alternative fuels could increase primarily as a result of implementing ~~3023~~ 2012 AQMP ozone control measures, especially those affecting mobile sources. However, the analysis concluded that increased demand for alternative fuels as transportation fuels is not expected to be significant since they are not widely available and their use is currently limited. Therefore, energy impacts associated with the 2012 AQMP ozone control measures (see Table 4.3-1) were evaluated and determined to be less than significant for petroleum fuels and alternative fuels.

6.5.3.1.3 Project-specific and Cumulative Impacts Conclusion

It was concluded in Subchapter 4.1 that 2012 AQMP control measures, both PM2.5 and ozone control measures, could generate potential adverse impacts related to increased demand for electricity, natural gas, petroleum fuels, and alternative fuels. When considering overall electricity, natural gas, petroleum fuels, and alternative fuels impacts from the 2012 AQMP PM2.5 and ozone control measures, although potential adverse energy impacts were identified, none exceeded any of the energy significance thresholds identified in Subsection 4.3.3. Therefore, project-specific aesthetics impacts associated with the 2012 AQMP are less than significant.

Since, anticipated project-specific energy impacts from the 2012 AQMP are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific energy impacts from the 2012 AQMP were evaluated in connection with energy impacts from SCAG's 2012-2035 RTP/SCS. Since project-specific energy impacts would be significant, the 2012 AQMP would contribute to significant adverse cumulative energy impacts generated by the 2012-2035 RTP/SCS. Since energy impacts from the 2012 AQMP are cumulatively considerable, cumulative energy impacts from the 2012 AQMP are significant.

6.5.3.2 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final Program EIR, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. Since the 2007 AQMP now includes only black box measures, energy impacts analysis for Alternative 1 will focus only on potential impacts identified for the black box measures. Potential energy impacts from implementing Alternative 1 are described in the following subsections.

6.5.3.2.1 PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason, Alternative 1 is not expected to create any energy impacts from PM2.5 control measures.

6.5.3.2.2 Ozone Control Measures

All remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. Potential impacts from adopting the 2007 AQMP were evaluated in the 2007 Program EIR. The 2007 Program EIR included an analysis of energy impacts from all control measures, including black box control measures. As a result, consistent with the assumption in Subsection 6.5.1.2 that significance determinations from the 2007 Program EIR continue to apply, it is concluded that Alternative 1 does not have the potential to generate potentially significant adverse energy impacts as shown in Table 6-10 and described in the following paragraphs.

It was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-01 regulating on-road light-duty vehicles and heavy-duty vehicles could generate potentially significant adverse energy impacts because of potential increases in demand primarily for electricity, natural gas, and other alternative fuels, displacing and potentially reducing demand for gasoline and diesel fuels. Potential energy demand impacts in the future from on-road light-duty vehicles and heavy-duty vehicles were concluded to be less than significant because total demand for energy in the on-road light- and heavy-duty vehicle mobile source sectors was expected to be a small percentage of future energy demand in the district.

Similarly, it was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-02 regulating off-road heavy duty vehicles could also generate potentially significant adverse energy impacts because of potential increases in demand primarily for electricity, natural gas, and other alternative fuels, displacing and potentially reducing demand for diesel fuels. Potential energy demand impacts were concluded to be less than significant because total demand for energy in the off-road heavy duty vehicle sector was expected to be a small percentage of future energy demand in the district.

6.5.3.2.3 Project-specific and Cumulative Impacts Conclusion

As indicated in Subsection 6.4.1, the SCAQMD and CARB have adopted all short-term control measures within their authority, so that only black box control measures remain. Since Alternative 1 does not include short-term control measures, potential energy impacts would be even less compared to the 2007 AQMP when it was originally adopted. It was concluded in the 2007 Program EIR that the 2007 AQMP ozone control measures would not generate significant adverse energy impacts. Consequently, overall energy impacts from Alternative 1 are concluded to be less than significant.

Since, anticipated project-specific energy impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific energy impacts would be less than significant and less than those generated by the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative energy impacts generated by the 2012-2035 RTP/SCS. Since energy impacts from Alternative 1 are not cumulatively considerable, cumulative energy impacts from Alternative 1 are not significant.

6.5.3.3 Alternative 2 – Localized PM Emissions Control

As explained in Subsection 6.4.2, with the CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS), CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. As explained in the following subsections, potential energy impacts from implementing Alternative 2 would be the same as potential energy impacts from implementing the 2012 AQMP. For the complete analysis of energy impacts from the 2012 AQMP, refer to Subchapter 4.3 – Energy. Potential energy impacts from implementing Alternative 2 are described in the following subsections.

6.5.3.3.1 PM2.5 Control Measures

As shown in Table 4.3-1, there are a number of 2012 AQMP PM2.5 control measures that have the potential to generate adverse energy impacts associated with implementing the 2012 AQMP PM2.5 control measures. Of the two Alternative 2 PM2.5 episodic control measures affecting the Mira Loma area, only one, CMALT-2C (2012 AQMP PM2.5 Control Measure BCM-04), was identified as contributing to potential adverse energy impacts. However, 2012 AQMP PM2.5 Control Measure BCM-04 only regulates affected livestock facilities in the Mira Loma area, so it is the same as Alternative 2 PM2.5 Control Measure CMALT-2C. Consequently, energy impacts from implementing 2012 AQMP ~~or~~ Alternative 2 PM2.5 control measures would be the same and less than significant.

6.5.3.3.2 Ozone Control Measures

Because Alternative 2 contains the same ozone control measures as the 2012 AQMP, except that ozone Control Measure CMALT-2A (similar to 2012 AQMP Control Measure ONRD-04) applies only to the Mira Loma area, energy impacts from implementing Alternative 2 ozone control measures would be the same as the energy impacts from implementing the 2012 AQMP ozone control measures. As shown in Table 4.3-1 in Subchapter 4.3, the analysis of electricity, natural gas, petroleum fuels, and alternative fuels impacts from implementing the 2012 AQMP ozone control measures indicated that they have the potential to generate adverse energy impacts. The analysis concluded that electricity and natural gas impacts associated with implementing the 2012 AQMP ozone control measures would be significant, while impacts to petroleum fuels, alternative fuels, and renewable fuels were concluded to be less than significant. This same conclusion also applies to Alternative 2 because it contains the same ozone control measures that have the potential to affect energy resources as the 2012 AQMP. Measures to mitigate significant adverse electricity and natural gas impacts were identified and would apply to Alternative 2. The analysis concluded, however, that in spite of implementing the electricity and natural gas mitigation measures, impacts would remain significant.

6.5.3.3.3 Project-specific and Cumulative Impacts Conclusion

As explained above, overall, potential project-specific adverse energy impacts from Alternative 2 would be the same as potential project-specific energy impacts from the 2012 AQMP and both would be significant.

Since, anticipated project-specific energy impacts from Alternative 2 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific energy impacts would be significant and approximately equivalent to those generated by the 2012 AQMP, Alternative 2 would contribute to significant adverse cumulative energy impacts generated by the 2012-2035 RTP/SCS. Since energy impacts from Alternative 2 are cumulatively considerable, cumulative energy impacts from Alternative 2 are significant and equivalent to the 2012 AQMP.

6.5.3.4 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except it does not include 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. As explained in the following subsections, potential energy impacts from implementing Alternative 3 would be the same as potential energy impacts from implementing the 2012 AQMP. For the complete analysis of energy impacts from the 2012 AQMP, refer to Subchapter 4.3 – Energy.

6.5.3.4.1 PM2.5 Control Measures

As shown in Table 4.3-1, there are a number of 2012 AQMP PM2.5 control measures that have the potential to generate adverse energy impacts associated with implementing the 2012 AQMP PM2.5 control measures. Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP, except for BCM-01. PM2.5 Control Measure BCM-01 was evaluated for the potential to generate adverse energy impacts, but it was concluded that this control measure did not have the potential to generate any energy impacts. It was concluded in the analysis of potential adverse energy impacts from implementing 2012 AQMP PM2.5 control measures that natural gas, petroleum fuels, and alternative fuels impacts would be less than significant. As with the 2012 AQMP, electricity impacts would be significant for the same reasons. Since Alternative 3 contains the same PM2.5 control measures as the 2012 AQMP, potential electricity, natural gas, petroleum fuels, and alternative fuels impacts would be same as energy impacts from implementing 2012 AQMP. Since all remaining PM2.5 control measures in Alternative 3 are the same as those in the 2012 AQMP, energy impacts from implementing Alternative 3 PM2.5 control measures would be significant and equivalent to energy impacts from the 2012 AQMP.

6.5.3.4.2 Ozone Control Measures

All ozone control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 ozone Control Measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (750 trucks per year that would be diesel or diesel-hybrids that comply with the year 2010 exhaust emission standards and 250 trucks per year that would use CNG engines for a total of 1,000 trucks per year). Similarly, Alternative 3 OFFRD-01 could result in a total of 19,344 additional repowered vehicles from the year 2014 through 2017. Energy impacts for the 2012 AQMP were analyzed by type of energy source and, since Alternative 3 Ozone Control Measures ONRD-03 and OFF-01 may contribute adverse impacts to each type of energy source, the same approach will be used here.

Electricity: Mobile source control measures in the 2012 AQMP are expected to increase the electricity demand in the district. A number of control measures would result in an increase in electricity demand associated with the electrification of mobile sources, including Control Measure ONRD-03. (Control Measure OFFRD-03 is not expected to increase demand for electricity since electric motors are not generally available for repowering off-road vehicles.) Although it is not expected that this category of heavy-duty on-road trucks would use electricity, consistent with the analysis of the 2012 AQMP electricity impacts, a worst-case assumption was made that mobile sources could switch to battery electric or hybrid vehicles. Table 6-20 shows the anticipated energy demand from Alternative 3 compared to the 2012 AQMP for those control measures where sufficient information is available to quantify electricity impacts.

TABLE 6-20

Electricity Impacts for Los Angeles, Orange, Riverside, and San Bernardino Counties (gigawatt-hours)

Control Measure	2010	2012 AQMP 2023 [a]	ALT. 3 2023
Baseline	115,000	136,079	136,079
ONRD-01 – Incentivize light- and medium-duty trucks (9,000 vehicles) [c]	--	38.6	38.6
ONRD-02 – Accelerated retirement and replacement of pre-1992 light- and medium-duty vehicles (18,000 vehicles) [b]	--	77.1	77.1
ONRD-03 – Encourage the introduction of hybrid and zero-emission vehicles (5,000 vehicles) [c]	--	83	166
ONRD-05 – Replace 1000 trucks with zero-emission vehicles (1000 vehicles) [e]	--	49.5	49.5
ADV-01 – “Wayside” Electric Roadway Infrastructure of the I-710 and 60 Freeways		563	563
ADV-02 – “Wayside” Electric Rail Infrastructure		880	880
Total of Mobile Source Measures	--	1,774.2	1,857.2
Percent of Baseline	--	1.54%	1.61%

Source: CEC, 2012a

[a] Projections based on CEC, 2012j

[b] Based on 12,600 miles/year and 0.34 kWh/mile.

[c] Based on 16,600 miles/year and 1 kWh/mile.

[d] Based on 18,000 miles/year and 2.75 kWh/mile.

Because electricity information is not available for all ozone control measures, increased electricity demand could be greater than shown in Table 6-20. Therefore, electricity demand impacts are concluded to be significant and greater than the 2012 AQMP. Because the primary effect of Alternative 3 would be to increase electricity demand for mobile sources, no mitigation measures were identified to reduce electricity demand impacts from this alternative. Because electricity demand impacts are concluded to be significant for Alternative 3, the same mitigation measures identified for the 2012 AQMP also apply to this alternative.

Natural Gas: A number of control measures in the 2012 AQMP may result in an increase in demand for natural gas associated with stationary sources due to the need for additional emission controls. Other control measures are expected to encourage the use of natural gas as a fuel to offset the use of petroleum fuels including ONRD-03. In addition, increased demand for electricity will require additional natural gas, as most of the power plants in California are operated using natural gas.

According to the CEC, there were about 24,819 light-duty natural gas and about 11,500 heavy-duty natural gas vehicles in California in 2009 (CEC, 2011). The CEC expects a steady increase in natural gas consumption used as an alternative fuel (see Table 4.3-4 of this Final Program EIR). As indicated in Subchapter 4.3 of this Final Program EIR, some of the control measures in the 2012 AQMP could result in an increase in the use of natural gas in medium- and heavy-duty on road vehicles. It is expected that Alternative 3 Control Measure ONRD-03 has the potential to expand the use of natural gas fuels in on-road medium-duty and heavy-duty trucks using more efficient, advanced natural gas engine technologies by approximately 750 vehicles. Although Alternative 3 Control Measure OFFRD-01 has the potential to accelerate the penetration of heavy-duty off-road vehicles by as much as 19,344 it is unknown and, therefore, speculative regarding how many of these vehicles would repower using natural gas engines. Otherwise, natural gas impacts from other Alternative 3 ozone control measures are expected to be significant and slightly greater than the 2012 AQMP. Because natural gas demand impacts are concluded to be significant, mitigation measures were identified required and would apply to Alternative 3. The analysis concluded, however, that in spite of implementing the electricity and natural gas mitigation measures, impacts would remain significant.

Petroleum Fuels: Similar to the effects of the 2012 AQMP, implementing Alternative 3 is expected to result in a decrease in the future increased demand for petroleum fuels (e.g., diesel, distillate, residual oil, and gasoline) due to mobile source control measures, as well as a potential increase in engine efficiency associated with the retrofit of new engines. Ozone control measures that are expected to result in a reduction in the demand for petroleum fuels include Control Measure ONRD-03. Table 6-21 shows the reduction in demand for petroleum fuels for Alternative 3 compared to the 2012 AQMP.

TABLE 6-21

Estimated Reduction in Petroleum Fuels Associated with 2012 AQMP Control Measures (gallons per year)

Control Measure	2012 AQMP 2013	2012 AQMP 2023	ALT.3 2013	ALT. 3 2023
ONRD-01 – Incentivize light- and medium-duty trucks (9,000 vehicles) [a]	663,157	5,968,421	663,157	5,968,421
ONRD-02 – Accelerated retirement and replacement of pre-1992 light- and medium-duty vehicles (18,000 vehicles) [a]	1,326,315	11,936,842	1,326,315	11,936,842
ONRD-03 – Encourage the introduction of hybrid and zero-emission vehicles (5,000 vehicles) [b]	3,018,122	15,091,090	3,018,122	15,091,090
ADV-02 – Electrification of 492 locomotive engines [c]	--	34,700,000	--	34,700,000
Total	**5,007,594**	**67,696,353**	**5,007,594**	**67,696,353**

[a] Based on 12,600 miles/year and 19 miles/gallon.
[b] Based on 16,600 miles/year and 11 miles/gallon.
[c] Based on 18,000 miles/year and 6 miles/gallon.
[d] Control measure ONRD-4 starts in 2015.

Construction activities that could be required to implement control measures in the 2012 AQMP would also increase the use of gasoline and diesel, including ozone Control Measure OFFRD-01. Construction activities could be required under a number of the control measures to develop transportation infrastructure (e.g., overhead catenary lines), install air pollution control equipment, and further develop electricity to support electrification of sources. OFFRD-01 has the potential to accelerate the turnover of up to 19,344 off-road mobile source vehicles. Currently, there are adequate fuel supplies in California. In fiscal year 2011, 14,728,734,063 gallons of gasoline and 2,564,017,901 gallons of diesel were sold in California[4]. Construction activities are temporary and all construction equipment will cease once construction activities are finished. As the use of petroleum fuels in other mobile sources decreases, there is likely to be an excess availability of gasoline and diesel. Even if all off-road mobile sources affected by Control Measure OFFRD-01 use diesel engines, it is unlikely that demand for diesel for these vehicles would offset the reduction in demand for diesel shown in Table 6-21. Petroleum fuel impacts from Alternative 3 for other control measures would be equivalent to the 2012 AQMP. Therefore, demand for petroleum fuels is expected to be less than significant for Alternative 3, but greater than similar impacts from the 2012 AQMP.

[4] State Board of Equalization, Fuel Taxes Statistics & Reports, http://www.boe.ca.gov/sptaxprog/spftrpts.htm.

Alternative Fuels: Electricity, natural gas (including forms such as CNG, etc.), and diesel (which would include biodiesel) have already been evaluated in the above paragraphs. As noted in Subchapter 4.3, potential alternative fuel M85 is no longer sold in California. Although ethanol is used as a fuel additive, this primarily for gasoline powered on-road passenger cars and light-duty trucks and would not likely be used in vehicles affected by Alternative 3 ozone Control Measures ONRD-03 or OFFRD-01. While hydrogen fuel cell technology is promising, its use in the future is dependent on many things (cost-effectiveness of the technology, availability of hydrogen, etc.), so that the extent to which it may be used in the future to displace petroleum fuels is currently unknown and, therefore, speculative.

Potential energy impacts associated with the Alternative 3 ozone control measures (21 control measures, see Table 4.4-1) were evaluated and determined to be less than significant for reformulated coatings, adhesives, solvents, lubricants, mold release, and consumer products. Implementing ozone control measures that result in the use of ammonia in emission control systems could generate significant adverse energy impacts from exposure to ammonia in the event of an accidental release. Mitigation measures were identified that could reduce ammonia energy impacts to less than significant. Finally, ozone control measures that increase demand for alternative fuels (LNG) have the potential to generate significant adverse energy impacts. No mitigation measures were identified that could reduce energy impacts from alternative fuels to less than significant. Since Alternative 3 ozone Control Measures ONRD-03 and OFFRD-01 have the potential to increase demand for alternative fuels to a greater extent for on-road heavy-duty vehicles and a much greater extent for off-road vehicles compared to the 2012 AQMP, energy impacts from Alternative 3 are significant and greater than significant energy impacts from the 2012 AQMP.

In general, energy demand impacts from Alternative 3 would be greater than energy demand impacts from the 2012 AQMP. The energy impacts associated with the Alternative 3 ozone control measures were evaluated and determined to be less than significant for natural gas, petroleum fuels, and alternative fuels impacts. Impacts from increased demand for electricity were concluded to be significant for Alternative 3 and for the 2012 AQMP.

6.5.3.4.3 Project-specific and Cumulative Impacts Conclusion

Based on the above information, potential project-specific adverse energy impacts from Alternative 3 for natural gas, petroleum fuels, and alternative fuels would be greater than potential project-specific natural gas, petroleum fuels, and alternative fuels impacts from the 2012 AQMP, but for both projects natural gas, petroleum fuels, and alternative fuels impacts would be less than significant. Potential project-specific adverse energy impacts from Alternative 3 for electricity would be greater than potential project-specific electricity impacts from the 2012 AQMP and for both projects electricity impacts would be significant.

Since, anticipated project-specific petroleum fuels, alternative fuels, and renewable fuels impacts from Alternative 3 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Since, anticipated project-specific electricity and natural gas demand impacts from Alternative 3 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific energy impacts would be significant and greater than those generated by the 2012 AQMP, Alternative 3 would contribute to significant adverse cumulative energy impacts generated by the 2012-2035 RTP/SCS. Therefore, since energy impacts (electricity and natural gas demand impacts from Alternative 3 are cumulatively considerable, cumulative energy impacts from Alternative 3 are significant and greater than the 2012 AQMP.

6.5.3.5 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.3, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter. For the complete analysis of energy impacts from 2012 AQMP PM2.5 control measures, refer to Subchapter 4.3 – Energy. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2 of this Final Program EIR. As a result, impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1. Potential energy impacts from implementing Alternative 4 are described in the following subsections.

6.5.3.5.1 PM2.5 Control Measures

As shown in Table 4.3-1 of this Final Program EIR, there are a number of 2012 AQMP PM2.5 control measures that have the potential to generate adverse energy impacts associated with implementing the 2012 AQMP PM2.5 control measures. It was concluded in the analysis of potential adverse energy impacts from implementing 2012 AQMP PM2.5 control measures that electricity, natural gas, petroleum fuels, and alternative fuels impacts would be less than significant. Since Alternative 4 contains the same PM2.5 control measures as the 2012 AQMP, potential electricity, natural gas, petroleum fuels, and alternative fuels impacts would be same as energy impacts from implementing 2012 AQMP. Consequently, energy impacts from implementing Alternative 4 PM2.5 control measures would also be less than significant.

6.5.3.5.2 Ozone Control Measures

Adopting Alternative 4 ozone control measures would result in the same potential adverse energy impacts as would occur under Alternative 1. It was concluded in the analysis of impacts from Alternative 1 that all remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. Potential impacts from adopting the 2007 AQMP were evaluated in the 2007 Program EIR. The 2007 Program EIR included an analysis of energy impacts from all control measures, including black box control measures. As a result, consistent with the assumption in Subsection 6.5.1.2 that significance determinations from the 2007 Program EIR continue to apply, it is concluded that Alternative 1 does not have the potential to generate potentially significant adverse energy impacts as shown in Table 6-10 and described in the following paragraphs.

It was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-01 regulating on-road light-duty vehicles and heavy-duty vehicles could generate potentially significant adverse energy impacts because of potential increases in demand primarily for electricity, natural gas, and other alternative fuels, displacing and potentially reducing demand for gasoline and diesel fuels. Potential energy demand impacts in the future from on-road light-duty vehicles and heavy-duty vehicles were concluded to be less than significant because total demand for energy in the on-road light- and heavy-duty vehicle mobile source sectors was expected to be a small percentage of future energy demand in the district.

Similarly, it was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-02 regulating off-road heavy duty vehicles could also generate potentially significant adverse energy impacts because of potential increases in demand primarily for electricity, natural gas, and other alternative fuels, displacing and potentially reducing demand for diesel fuels. Potential energy demand impacts were concluded to be less than significant because total demand for energy in the off-road heavy duty vehicle sector was expected to be a small percentage of future energy demand in the district.

6.5.3.5.3 Project-specific and Cumulative Impacts Conclusion

Based upon the above conclusions, when considering overall energy impacts from implementing Alternative 4, adverse energy impacts were identified from implementing ozone control measures, but these impacts were concluded to be less than significant. Potentially significant adverse electricity and natural gas impacts were identified from implementing the PM2.5 control measures, but would be less than similar impacts from the 2012 AQMP. Therefore, it is concluded that potential adverse energy impacts from implementing Alternative 4 would be significant, but less than those for the 2012 AQMP because Alternative 4 contains fewer control measures that could adversely affect electricity, natural gas, petroleum fuels, and alternative fuels resources.

Since anticipated project-specific energy impacts from Alternative 4 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific energy impacts would be significant, although less than those generated by the 2012 AQMP, Alternative 4 would contribute to significant adverse cumulative energy impacts generated by the 2012-2035 RTP/SCS. Since energy impacts from Alternative 4 are cumulatively considerable, cumulative energy impacts from Alternative 4 are significant.

6.5.4 Hazards and Hazardous Materials

The potential direct and indirect hazards and hazardous materials impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of direct and indirect hazards and hazardous materials impacts from each alternative relative to the 2012 AQMP.

6.5.4.1 Proposed Project

Potential direct and indirect hazards and hazardous materials impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.4 – Hazards and Hazardous Materials.

6.5.4.1.1 PM2.5 Control Measures

The analysis in Subchapter 4.4 identified three 2012 AQMP PM2.5 control measures, CMB-01, IND-01, and MCS-01 that have the potential to generate the following adverse hazards and hazardous materials impacts. Use of alternative fuels and fuel additives can result in hazard impacts for some fuels (e.g., LNG and CNG) in the event of an accidental release during transport. Potential exposure to a toxic air contaminant, ammonia, used as a NOx reducing agent for SCRs and SNCR in the event of an onsite accidental release during use or storage could also occur as a result of implementing 2012 AQMP PM2.5 control measures. Reformulating coatings with more toxic or flammable solvents could cause fire, accidental release, and offsite/onsite exposure and worker risk. Hazard impacts from transport of alternative fuels (LNG) were concluded to be significant. Hazard impacts from exposure to ammonia vapor were concluded to be significant, but could be reduced to less than significant.

6.5.4.1.2 Ozone Control Measures

The analysis in Subchapter 4.7 identified a number of 2012 AQMP ozone control measures as having the potential to create the following adverse hazards and hazardous materials impacts.

- Low VOC coatings could be formulating with more toxic or flammable solvents could cause fire, accidental release, and offsite/onsite exposure and worker risk. This potential impact is considered to be significant. Mitigation measures were identified to reduce this potential hazards and hazardous materials impact to less than significant.
- Receptors could be exposed to hazardous waste that may be generated from spent carbon, use of ammonia to operate condensers, hazardous waste from operating scrubbers, and hazardous waste of spent catalyst from operating thermal oxidizers. This impact was concluded to be less than significant.
- Use of alternative fuels and fuel additives can result in hazard impacts during transport. This impact was concluded to be significant and no mitigation measures were identified that could potentially reduce hazard impacts from and accidental release of alternative fuels during transport.
- Potential exposure to toxic air contaminant (ammonia) associated with SCRs during storage, transport, use and accidental release. Hazard impacts from exposure to accidental releases of ammonia were concluded to be less than significant, except for potential onsite releases, which were concluded to be significant, but could be reduced to less than significant.

The hazard impacts associated with the ozone control measures control measures, see Table 4.4-1, were evaluated and determined to be less than significant for reformulated coatings, adhesives, solvents, lubricants, mold release, and consumer products; and all alternative fuels except LNG.

6.5.4.1.3 Project-specific and Cumulative Impacts Conclusion

It was concluded in Subchapter 4.4 that potential hazards and hazardous materials impacts from implementing 2012 AQMP PM2.5 and ozone control measures would be less than significant for most control measures. In the case of exposure to accidental releases onsite at a commercial or industrial facility, impacts were concluded to be significant, but could be reduced to less than significant through implementing mitigation measures. Finally, hazard impacts from transporting LNG were concluded to be significant and no mitigation measures were identified that could reduce these potential hazard impacts to less than significant. Therefore, project-specific hazards and hazardous materials impacts associated with the 2012 AQMP are concluded to be significant.

Since, anticipated project-specific hazards and hazardous materials impacts from the 2012 AQMP are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific hazard and hazardous materials impacts from the 2012 AQMP were evaluated in connection with hazardous materials impacts from SCAG's 2012-2035 RTP/SCS. Since project-specific hazards and hazardous materials impacts generated by the 2012 AQMP would be significant, the 2012 AQMP would contribute to significant adverse cumulative hazard and hazardous materials impacts generated by the 2012-2035 RTP/SCS. Since hazards and hazardous materials impacts from the 2012 AQMP are cumulatively considerable, cumulative hazards and hazardous materials impacts from the 2012 AQMP are significant.

6.5.4.2 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final Program EIR, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. The only remaining control measures are the black box measures. Since the 2007 AQMP now includes only black box measures, environmental impacts for Alternative 1 will focus only on potential impacts identified for the black box measures.

6.5.4.2.1 PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason, Alternative 1 is not expected to create any impacts to hazards and hazardous materials resources from PM2.5 control measures.

6.5.4.2.2 Ozone Control Measures

Potential impacts from adopting the 2007 AQMP were evaluated in the 2007 Program EIR. The 2007 Program EIR included an analysis of hazards and hazardous materials impacts from all control measures, including black box control measures. As a result, consistent with the assumptions in Subsection 6.5.1.2 regarding the applicability of the significance determinations from the 2007 Program EIR, it is concluded that Alternative 1 does not have the potential to generate potentially significant hazard and hazardous materials impacts as shown in Table 6-10 and described in the following paragraphs.

All remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. It was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-01 regulating on-road light-duty vehicles and heavy-duty vehicles could generate potentially significant adverse hazards and hazardous materials impacts. In particular, one of the NOx pollution control technologies that could be used for heavy-duty on-road vehicles could consist of SCR equipment. SCR uses ammonia as a reducing agent to convert NOx to nitrogen and water. Potential hazard and hazardous materials impacts from the use of SCR on heavy-duty vehicles were concluded to be less than significant because aqueous ammonia in concentrations less than 20 percent by volume would be used. No significant adverse hazards or hazardous materials impacts were identified using aqueous ammonia in concentrations less than 20 percent by volume.

Similarly, it was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-02 regulating off-road heavy duty vehicles could also generate potentially significant adverse hazards and hazardous materials impacts for the same reason identified for SCLTM-01 (e.g., installation of SCRs on off-road mobile sources that use ammonia as a reducing agent). Potential hazards and hazardous materials impacts were concluded to be less than significant for the same reason as above, aqueous ammonia in concentrations less than 20 percent by volume would be used.

Finally, it was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-03 regulating the VOC content of consumer products could generate potentially significant adverse hazards and hazardous materials impacts. The reason for this conclusion is that future rules regulating consumer products could result in formulations that are more flammable or toxic than current formulations. This impact, however, was concluded to be less than significant if water-based formulations are used. Further, solvents are currently available such as Texanol, propylene glycol, etc., that would not generate significant adverse flammability or hazard impacts.

6.5.4.2.3 Project-specific and Cumulative Impacts Conclusion

It was concluded in the 2007 Program EIR that all 2007 AQMP that, even with the implementation of mitigation measure HZ1, the 2007 AQMP had the potential to generate significant adverse hazards and hazardous materials impacts. Potential hazards and hazardous materials impacts could occur primarily from implementing Control Measure ARB-ONRD-03[5]/SCFUEL-01 – California Phase 3 Reformulated Gasoline Modifications. Other control measures that have the potential of affecting motor vehicle fuel formulations include: SC-ONRD-01, SCFUEL-02, ARB-ONRD-4/SCONRD-03, and ARB-OFFRD-1. As indicated in Subsection 6.4.1, the SCAQMD and CARB have adopted all short-term control measures within their authority, so that only black box control measures remain. Since Alternative 1 does not include short-term control measures, potential hazard and hazardous materials impacts would be even less compared to the 2007 AQMP when it was

[5] Short-term control measures adopted by CARB were revised and renamed, so it is not possible to identify a CARB measure identified as ARB-ONRD-03, for example.

originally adopted. Consequently, overall hazards and hazardous materials impacts from Alternative 1 are concluded to be less than significant.

Since, anticipated project-specific hazards and hazardous materials impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific hazards and hazardous materials impacts would be less than those generated by the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative hazards and hazardous materials impacts generated by the 2012-2035 RTP/SCS. Since hazards and hazardous materials impacts from Alternative 1 are not cumulatively considerable, cumulative hazards and hazardous materials impacts from Alternative 1 are not significant.

6.5.4.3 Alternative 2 – Localized PM Emissions Control

As explained in Subsection 6.4.2, with the exception of the two episodic PM2.5 control measures for Mira Loma, CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS) and CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), and one episodic ozone control measure, CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. As explained in the following subsections, potential hazards and hazardous materials impacts from implementing Alternative 2 would be the same as potential hazards and hazardous materials impacts from implementing the 2012 AQMP. For the complete analysis hazards and hazardous materials impacts from the 2012 AQMP, refer to Subchapter 4.4 – Hazards and Hazardous Materials. Potential noise impacts from implementing Alternative 2 are described in the following subsections.

6.5.4.3.1 PM2.5 Control Measures

Similar to the analysis of hazards and hazardous materials impacts for the 2012 AQMP in Subchapter 4.4, none of the two PM2.5 control measures in Alternative 2 that regulates the same sources as the episodic control measures in the 2012 AQMP was identified as contributing to construction hazards and hazardous materials impacts. However, because all other 2012 AQMP PM2.5 control measures, including those contributing to significant adverse hazards and hazardous materials impacts, are also included in Alternative 2, it has the potential to generate the same hazards and hazardous materials impacts as implementing the 2012 AQMP, which were concluded to be significant. This same conclusion applies to Alternative 2.

6.5.4.3.2 Ozone Control Measures

Because Alternative 2 contains the same ozone control measures as the 2012 AQMP, except that ozone Control Measure CMALT-2A (similar to 2012 control measure ONRD-04) applies only to the Mira Loma area, potential hazards and hazardous materials impacts from implementing Alternative 2 ozone control measures would be similar to the hazards and hazardous materials impacts from implementing the 2012 AQMP ozone control measures: VOC coatings could be formulated~~ing~~ with more toxic or flammable solvents (not significant); exposure to hazardous waste from spent carbon, use of ammonia, and spent catalyst from operating thermal oxidizers, etc., (not significant); and exposure to toxic air contaminant (ammonia) associated with SCRs during storage, transport, use and accidental release (mitigated to less than significant). Potential hazard and hazardous materials impacts from catastrophic releases of alternative fuels during transport (significant and unavoidable), would be slightly less because it is expected that fewer vehicles would be affected. Similar to the significance determination for potential hazards and hazardous materials impacts of the ozone control measures from the 2012 AQMP, hazards and hazardous materials impacts under Alternative 2 would also be significant, but would be slightly less compared to the 2012 AQMP. The mitigation measures (see Subchapter 4.4) identified to reduce potential hazards and hazardous materials impacts from the 2012 control measures would continue to apply to Alternative 2.

6.5.4.3.3 Project-specific and Cumulative Impacts Conclusion

Overall, potential hazards and hazardous materials impacts from implementing Alternative 2 PM2.5 and ozone control measures could generate significant adverse hazards and hazardous materials impacts. Mitigation measures were identified that could reduce hazard impacts from exposure to onsite releases of ammonia to less than significant. No mitigation measures were identified that could reduce hazard impacts from catastrophic releases of alternative fuels during transport. Therefore, project-specific hazards and hazardous materials impacts associated with Alternative 2 are concluded to be significant and less than the 2012 AQMP.

Since, anticipated project-specific hazards and hazardous materials impacts from Alternative 2 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific hazards and hazardous materials impacts would be significant, less than those generated by the 2012 AQMP, Alternative 2 would contribute to significant adverse cumulative hazards and hazardous materials impacts generated by the 2012-2035 RTP/SCS. Since hazards and hazardous materials impacts from the Alternative 2 are cumulatively considerable, cumulative hazards and hazardous materials impacts from the Alternative 2 are significant and less than the 2012 AQMP.

6.5.4.4 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except it does not include 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. As explained in the following subsections, potential hazards and hazardous materials impacts from implementing Alternative 3 would be the same as potential hazards and hazardous materials impacts from implementing the 2012 AQMP. For the complete analysis of hazards and hazardous materials impacts from the 2012 AQMP, refer to Subchapter 4.4 – Hazards and Hazardous Materials.

6.5.4.4.1 PM2.5 Control Measures

Alternative 3 includes all of the same 2012 AQMP PM2.5 control measures, except BCM-01, so it has the potential to generate similar hazards and hazardous materials impacts as implementing the 2012 AQMP. PM2.5 control measures were identified as having the potential to generate significant adverse exposure impacts to a toxic air contaminant (ammonia) associated with SCRs and SNCR during storage, transport, use and accidental release. Mitigation measures were identified that could reduce this impact to less than significant. Use of alternative fuels and fuel additives could also result in hazard impacts, which were concluded to be significant. No mitigation measures were identified that could reduce hazard impacts from alternative fuels to less than significant. The hazard impacts associated with PM2.5 control measures (CMB-01, IND-01, and MCS-01) were evaluated and determined to be less than significant for reformulated coatings, adhesives, solvents, lubricants, mold release, and consumer products; alternative fuels; ammonia use in SCRs, and fuel additives. Since BCM-01 was not identified as a PM2.5 control measure that could generate hazards or hazardous materials impacts, hazards and hazardous materials impacts from Alternative 3 PM2.5 control measures would be equivalent to those from the 2012 AQMP.

6.5.4.4.2 Ozone Control Measures

All ozone control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 ozone Control Measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (750 trucks per year that would be diesel or diesel-hybrids that comply with the year 2010 exhaust emission standards and 250 trucks per year that would use CNG engines for a total of 1,000 trucks per year). Similarly, Alternative 3 OFFRD-01 could result in a total of 19,344 additional repowered vehicles from the year 2014 through 2017.

Potential hazard impacts associated with the Alternative 3 ozone control measures (21 control measures, see Table 4.4-1) were evaluated and determined to be less than significant for reformulated coatings, adhesives, solvents, lubricants, mold release, and consumer products. Implementing ozone control measures that result in the use of ammonia in emission control systems could generate significant adverse hazard impacts from exposure to ammonia in the event of an accidental release. Mitigation measures were identified that could reduce ammonia hazard impacts to less than significant. Finally, ozone control measures that increase demand for alternative fuels (LNG) have the potential to generate significant adverse hazard impacts. No mitigation measures were identified that could reduce hazard impacts from alternative fuels to less than significant. Since Alternative 3 ozone Control Measures ONRD-03 and OFFRD-01 have the potential to increase demand for alternative fuels to a greater extent for on-road heavy-duty vehicles and a much greater extent for off-road vehicles compared to the 2012 AQMP, hazard and hazardous materials impacts from Alternative 3 are significant and greater than significant hazards and hazardous materials impacts from the 2012 AQMP.

6.5.4.4.3 Project-specific and Cumulative Impacts Conclusion

Since, anticipated project-specific hazards and hazardous materials impacts from Alternative 3 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific hazards and hazardous materials impacts would be significant and greater than those generated by the 2012 AQMP, Alternative 3 would contribute to significant adverse cumulative hazards and hazardous materials impacts generated by the 2012-2035 RTP/SCS. Since hazards and hazardous materials impacts from Alternative 3 are cumulatively considerable, cumulative hazards and hazardous materials impacts from Alternative 3 are significant and greater than cumulative hazards and hazardous materials impacts from the 2012 AQMP.

6.5.4.5 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.4, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter, which are the same as those in the 2012 AQMP. For the complete analysis of hazards and hazardous materials impacts from 2012 AQMP PM2.5 control measures, refer to Subchapter 4.4 – Hazards and Hazardous Materials. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2. As a result, impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1. Potential hazards and hazardous materials impacts from implementing Alternative 4 are described in the following subsections.

6.5.4.5.1 PM2.5 Control Measures

Similar to the analysis of hazards and hazardous materials impacts for the 2012 AQMP in Subchapter 4.4, because Alternative 4 includes all of the same 2012 AQMP PM2.5 control measures, including those contributing to significant adverse hazards and hazardous materials impacts, it has the potential to generate the same hazards and hazardous materials impacts as implementing the 2012 AQMP, which were concluded to be significant. This same conclusion applies to Alternative 4.

6.5.4.5.2 Ozone Control Measures

Adopting Alternative 4 ozone control measures would result in the same potential adverse hazards and hazardous materials impacts as would occur under Alternative 1. It was concluded in the analysis of impacts from Alternative 1 that all remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. Potential impacts from adopting the 2007 AQMP were evaluated in the 2007 Program EIR. The 2007 Program EIR included an analysis of hazards and hazardous materials impacts from all control measures, including black box control measures. The 2007 AQMP Program EIR included analyses of the following types of hazards and hazardous materials impacts.

- Low VOC coatings could be formulating with more toxic or flammable solvents could cause fire, accidental release, and offsite/onsite exposure and worker risk. This potential impact is considered to be less than significant.
- Use of alternative fuels and fuel additives can result in hazard impacts during transport, handling and storage. This impact was concluded to be less than significant.
- Potential exposure to toxic air contaminant (ammonia) associated with SCRs during storage, transport, use and accidental release. Hazard impacts from exposure to accidental releases of ammonia were concluded to be less than significant.

As a result, consistent with the assumption in Subsection 6.5.1.2 that significance determinations from the 2007 Program EIR continue to apply, it is concluded that Alternative 1 does not have the potential to generate potentially significant adverse hazards and hazardous materials impacts as shown in Table 6-10 and described in the following paragraphs.

6.5.4.5.3 Project-specific and Cumulative Impacts Conclusion

Because Alternative 4 includes all of the same 2012 AQMP PM2.5 control measures, including those contributing to significant adverse hazards and hazardous materials impacts, it has the potential to generate the same hazards and hazardous materials impacts as implementing the 2012 AQMP, which were concluded to be significant. Potential hazards and hazardous materials impacts from Alternative 4 ozone control measures would be the same as those identified for Alternative 1. Since Alternative 1 does not include short-term control measures, potential hazard and hazardous materials impacts would be even less compared to the 2007 AQMP when it was originally adopted. Consequently, overall hazards and hazardous materials impacts from Alternative 4 are concluded to be significant, less than significant.

Since, anticipated project-specific hazards and hazardous materials impacts from Alternative 4 are concluded to be significant, but less than those generated by the 2012 AQMP, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific hazards and hazardous materials impacts would be significant, but less than those generated by the 2012 AQMP, Alternative 4 would contribute to significant adverse cumulative hazards and hazardous materials impacts generated by the 2012-2035 RTP/SCS. Since hazards and hazardous materials impacts from Alternative 4 are cumulatively considerable, cumulative hazards and hazardous materials impacts from Alternative 4 are significant.

6.5.5 Hydrology and Water Quality

The potential direct and indirect hydrology and water quality impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of direct and indirect hydrology and water quality impacts from each alternative relative to the 2012 AQMP.

6.5.5.1 Proposed Project

Potential direct and indirect hydrology and water quality impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.5 – Hydrology and Water Quality.

6.5.5.1.1 PM2.5 Control Measures

The hydrology and water quality impacts associated with PM2.5 control measures (e.g., BCM-03, IND-01, MCS-01, etc.) were analyzed and the following impacts were identified: water demand and wastewater discharge from operating wet ESPs or wet scrubbers, water quality impacts from the use of alternative fuels and fuel additives, water demand and water quality impacts from wastewater discharges from increased use of water-based formulations. Of the potential hydrology and water quality impacts analyzed, water demand impacts associated with the manufacture and use of waterborne and add-on air pollution control technologies were concluded to be significant. While mitigation measures were identified, water demand impacts are expected to remain significant. The hydrology and water quality impacts associated with wastewater generation and related wastewater quality are less than significant. Further, the use and application of SBS (BCM-04) on water quality is also expected to be less than significant.

6.5.5.1.2 Ozone Control Measures

Hydrology and water quality impacts associated with Ozone Control Measures are potentially significant for water demand (CTS-01, CTS-02, CTS-03, CTS-04, and FUG-01). The water quality impacts associated with wastewater generation and related wastewater quality from 2012 AQMP ozone control measures (CTS-01, CTS-02, CTS-03, CTS-04, and FUG-01) are less than significant. No significant adverse hydrology and water quality impacts are expected from the increased use of alternative fuels (IND-01, MSC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07). No significant adverse water quality impacts associated with increase battery use in EV and hybrid vehicles are expected (ONRD-01, ONRD-03, ONRD-04, ONRD-05, ADV-01, ADV-02, ADV-03, ADV-04, ADV-06, and ADV-07). Potential spills associated with ammonia are expected to be contained on-site due to the requirement for secondary spill containment devices and berms. Therefore, potential ammonia spills are expected to be less than significant.

6.5.5.1.3 Project-specific and Cumulative Impacts Conclusion

Water demand impacts from some types of air pollution control equipment (wet ESPs) and reformulating coatings with water-based coatings associated with 2012 AQMP PM2.5 and ozone control measures are potentially significant as indicated in the subsections above. No other hydrology or water quality impacts from 2012 AQMP PM2.5 or ozone control measures were identified. Further, it was concluded in Subchapter 4.5 that in spite of identifying water demand mitigation measures, implementing 2012 AQMP PM2.5 and ozone control measures has the potential to generate significant adverse water demand impacts. Therefore, project-specific water demand impacts from implementing 2012 AQMP PM2.5 and ozone control measures are concluded to be significant and unavoidable.

Since, anticipated project-specific water demand impacts from the 2012 AQMP are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific hydrology or water quality impacts from the 2012 AQMP were evaluated in connection with hydrology or water quality impacts from SCAG's 2012-2035 RTP/SCS. Further, since project-specific hydrology or water quality impacts (water demand impacts) generated by the 2012 AQMP would be significant, the 2012 AQMP would contribute to significant adverse cumulative hydrology or water quality impacts generated by the 2012-2035 RTP/SCS. Other hydrology or water quality impacts from implementing 2012 AQMP PM2.5 and ozone control measures were identified, but concluded to be less than significant. Since water demand impacts from the 2012 AQMP are cumulatively considerable, cumulative water demand impacts from the 2012 AQMP are significant. No measures beyond those identified in Subchapter 4.5 were identified to mitigate significant adverse cumulative water demand impacts.

6.5.5.2 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final Program EIR, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. The only remaining control measures are the black box measures. Since the 2007 AQMP now includes only black box measures, environmental impacts for Alternative 1 will focus only on potential impacts identified for the black box measures.

6.5.5.2.1 PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason, Alternative 1 is not expected to create any hydrology and water quality impacts from PM2.5 control measures.

6.5.5.2.2 Ozone Control Measures

Potential impacts from adopting the 2007 AQMP were evaluated in the 2007 Program EIR. The 2007 Program EIR included an analysis of hydrology and water quality impacts from all control measures, including black box control measures. As a result, consistent with the assumptions in Subsection 6.5.1.2 regarding the applicability of the significance determinations from the 2007 Program EIR, it is concluded that Alternative 1 does not have the potential to generate potentially significant hydrology and water quality impacts as shown in Table 6-10 and described in the following paragraphs.

All remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. It was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-01B regulating on-road heavy duty vehicles could generate potentially significant water quality impacts because potential emission reduction technologies such as alternative fuels or fuel additives, if accidentally released could readily dissolve in water and create adverse groundwater and surface water impacts. As indicated in the 2007 AQMP Program EIR, potential water quality impacts were concluded to be less than significant because alternative fuels and fuel additives would not generate greater water quality impacts in the event of an accidental release than accidental releases of gasoline and diesel fuels.

It was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-03 regulating the VOC content of consumer products could generate potentially significant adverse water demand impacts. The reason for this conclusion is that future rules regulating consumer products could result in greater use of water-based formulation, thus, increasing water demand to supply these types of products. This impact, however, was concluded to be less than significant because the projected future increase in water demand from implementing 2007 AQMP control measures did not exceed the SCAQMD's water demand significance threshold in effect at that time.

6.5.5.2.3 Project-specific and Cumulative Impacts Conclusion

It was concluded in the 2007 Program EIR that water quality impacts from implementing all 2007 AQMP control measures would not be significant. However, the following three mitigation measures were identified to ensure that water quality impacts would remain less than significant.

HWQ-1: To ensure that users of reformulated solvents are aware of the proper disposal methods for reformulated solvents, the SCAQMD will provide an outreach and education program for affected parties. The SCAQMD will coordinate the outreach program with POTWs, the DTSC, and other appropriate agencies.

HWQ-2: The Sanitation Districts and other sewage agencies must increase their surveillance programs to quantify measurable effects resulting from this control measure and take appropriate action as necessary.

HWQ-3: CARB will monitor the use and limit or prohibit the use of toxic air contaminants, including perchloroethylene and methylene chloride, in reformulated consumer products.

Because Control Measure SCLTM-03 contributed to water quality impacts identified in the 2007 AQMP, the above mitigation measures would continue to be applicable under Alternative 1.

Potentially significant water quality impacts from illegal disposal of spent batteries resulting in battery acid leaking into the environment were also identified in the 2007 AQMP. As a result, mitigation measures HWQ-4 and HWQ-5 were identified to mitigate this type of potential water quality impact. It was concluded that implementing these two mitigation measures would reduce potential water quality impacts from illegal disposal of spent batteries to less than significant. However, because no 2007 AQMP black box control measures contributed to this water quality impact, the mitigation measures are no longer applicable. As indicated in Chapter 2 of this Final Program EIR, the SCAQMD and CARB have adopted all short-term control measures within their authority, so that only black box control measures remain. Since Alternative 1 does not include short-term control measures, potential hydrology and water quality materials impacts would be even less compared to the 2007 AQMP when it was originally adopted. Consequently, overall hydrology and water quality impacts from Alternative 1 are concluded to be less than significant and less than hydrology and water quality impacts from the 2012 AQMP.

Since, anticipated project-specific hydrology and water quality impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific hydrology or water quality impacts would be less significant and less than those generated by the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative hydrology or water quality impacts generated by the 2012-2035 RTP/SCS. Since hydrology and water quality impacts from Alternative 1 are not cumulatively considerable, cumulative hydrology and water quality impacts from Alternative 1 are not significant and are less than cumulative hydrology and water quality impacts from the 2012 AQMP.

6.5.5.3 Alternative 2 – Localized PM Emissions Control

As explained in Subsection 6.4.2, with the exception of the two episodic PM2.5 control measures for Mira Loma, CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS) and CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), and one episodic ozone control measure, CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. As explained in the following subsections, hydrology and water quality impacts from implementing Alternative 2 would be the same as potential hydrology and water quality impacts from implementing the 2012 AQMP. For the complete analysis of hydrology and water quality impacts from the 2012 AQMP, refer to Subchapter 4.5 – Hydrology and Water Quality. Potential hydrology and water quality impacts from implementing Alternative 2 are described in the following subsections.

6.5.5.3.1 PM2.5 Control Measures

Because Alternative 2 contains most of the same PM2.5 control measures as the 2012 AQMP, it has the potential generate the same hydrology and water quality impacts. Potential hydrology and water quality impacts associated with Alternative 2 PM2.5 control measures (e.g., BCM-03, IND-01, MCS-01, etc.) were analyzed and the following impacts were identified: water demand and wastewater discharge from operating wet ESPs or wet scrubbers, water quality impacts from the use of alternative fuels and fuel additives, water demand and water quality impacts from wastewater discharges from increased use of water-based formulations. Of the potential hydrology and water quality impacts analyzed, water demand impacts associated with the manufacture and use of waterborne and add-on air pollution control technologies were concluded to be significant. While mitigation measures are available, they can vary from jurisdiction to jurisdiction, and may remain significant. The hydrology and water quality impacts associated with wastewater generation and related wastewater quality are less than significant. Further, the use and application of SBS (BCM-04) on water quality is also expected to be less than significant. Consequently, water demand impacts from Alternative 2 PM2.5 control measures are the same as water demand impacts from 2012 AQMP PM2.5 controls and are concluded to be significant.

6.5.5.3.2 Ozone Control Measures

Water demand impacts associated with Alternative 2 ozone control measures (CTS-01, CTS-02, CTS-03, CTS-04, and FUG-01) are potentially significant for water demand. Under Alternative 2, water quality impacts associated with wastewater generation and related wastewater quality from the same 2012 AQMP ozone control measures (see Subsection 6.5.5.1.2) are less than significant. Similarly, under Alternative 2 no significant adverse hydrology and water quality impacts are expected from the increased use of alternative fuels (see Subsection 6.5.5.1.2). No significant adverse water quality impacts associated with increase battery use in EV and hybrid vehicles are expected (see Subsection 6.5.5.1.2). Potential spills associated with ammonia are expected to be contained on-site due to the requirement for secondary spill containment devices and berms. Therefore, potential ammonia spills are expected to be less than significant. Overall, water demand impacts from Alternative 2 are concluded to be significant and equivalent to the 2012 AQMP. Water quality impacts from Alternative 2 are concluded to be less than significant and equivalent to the 2012 AQMP.

6.5.5.3.3 Project-specific and Cumulative Impacts Conclusion

Under Alternative 2, water demand impacts from some types of air pollution control equipment (wet ESPs) and reformulating coatings with water-based coatings would be the same as water demand impacts from the 2012 AQMP PM2.5 and ozone control measures and are potentially significant. As a result, the water demand mitigation measures identified in Subchapter 4.5 of this~~e~~ Final Program EIR would be applicable to Alternative 2. Similarly, in spite of applying the 2012 AQMP water demand mitigation measures, implementing Alternative 2 PM2.5 and ozone control measures has the potential to generate significant adverse water demand impacts. No other hydrology or water quality impacts from Alternative 2 PM2.5 or ozone control measures were identified. Therefore, project-specific water demand impacts from implementing Alternative 2 PM2.5 and ozone control measures are equivalent to water demand impacts from the 2012 AQMP and are concluded to be significant and unavoidable.

Since, anticipated project-specific water demand impacts from Alternative 2 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Other hydrology or water quality impacts from implementing Alternative 2 PM2.5 and ozone control measures were identified, but concluded to be less than significant. Further, since project-specific hydrology or water quality (water demand) impacts would be significant and approximately equivalent to those generated by the 2012 AQMP, Alternative 2 would contribute to significant adverse cumulative hydrology or water quality (water demand) impacts generated by the 2012-2035 RTP/SCS. Since water demand impacts from Alternative 2 are cumulatively considerable, cumulative water demand impacts from Alternative 2 are significant. No measures beyond those identified in Subchapter 4.5 were identified to mitigate significant adverse cumulative water demand impacts.

6.5.5.4 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except it does not include 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. As explained in the following subsections, potential hydrology and water quality impacts from implementing Alternative 3 PM2.5 control measures would be the same as potential hydrology and water quality impacts from implementing the 2012 AQMP. It is expected, however, that potential hydrology and water quality impacts from Alternative 3 ozone control measures would be greater than those from the 2012 AQMP.

6.5.5.4.1 PM2.5 Control Measures

Alternative 3 contains all of the same PM2.5 control measures as the 2012 AQMP, except BCM-01, however. BCM-01 was evaluated and it was concluded that it does not have the potential to contribute to hydrology and water quality impacts. Consequently Alternative 3 PM2.5 measures would generate hydrology water quality impacts equivalent to the 2012 AQMP. The analysis indicated that the 2012 AQMP has the potential generate potential hydrology and water quality impacts associated with PM2.5 control measures (e.g., BCM-03, IND-01, MCS-01, etc.) which were analyzed and the following impacts were identified: water demand and wastewater discharge from operating wet ESPs or wet scrubbers, water quality impacts from the use of alternative fuels and fuel additives, water demand and water quality impacts from wastewater discharges from increased use of water-based formulations. The hydrology and water quality impacts associated with wastewater generation and related wastewater quality are less than significant. Further, the use and application of SBS (BCM-04) on water quality is also expected to be less than significant. Consequently, water demand impacts from Alternative 3 PM2.5 control measures are the same as water demand impacts from 2012 AQMP PM2.5 controls and are concluded to be significant.

6.5.5.4.2 Ozone Control Measures

All ozone control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 ozone Control Measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (750 trucks per year that would be diesel or diesel-hybrids that comply with the year 2010 exhaust emission standards and 250 trucks per year that would use CNG engines for a total of 1,000 trucks per year). Similarly, Alternative 3 OFFRD-01 could result in a total of 19,344 additional repowered or replaced vehicles from the year 2014 through 2017. Hydrology and water quality impacts associated with Ozone control measures are potentially significant for water demand (CTS-01, CTS-02, CTS-03, CTS-04, and FUG-01). The water quality impacts associated with wastewater generation and related wastewater quality from 2012 AQMP control measures (CTS-01, CTS-02, CTS-03, CTS-04, and FUG-01) are less than significant. Less than significant adverse hydrology and water quality impacts are expected from the increased use of alternative fuels (IND-01, MSC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-

04, ADV-05, ADV-06, and ADV-07). Similarly, less than significant adverse water quality impacts associated with increase battery use in EV and hybrid vehicles are expected (ONRD-01, ONRD-03, ONRD-04, ONRD-05, ADV-01, ADV-02, ADV-03, ADV-04, ADV-06, and ADV-07). Potential spills associated with ammonia are expected to be contained on-site due to the requirement for secondary spill containment devices and berms. Therefore, potential ammonia spills are expected to be less than significant.

Although it is expected that ozone Control Measure ONRD-03 would result in double the number of trucks complying with the 2010 engine exhaust standards and OFFRD-01 would likely affect approximately three times as many vehicles, water quality impacts could be greater than for the 2012 AQMP, but they are not expected to be significant because the use of alternative fuels is not expected to result in any greater adverse water quality impacts than the use of conventional fuels like diesel or gasoline. Similarly, since none of the alternative fuels typically require water as part of their manufacturing or distribution processes, any increased use of alternative fuels under Alternative 3 would not likely be greater than under the 2012 AQMP.

Mitigation measures to reduce water demand impacts were identified for the 2012 AQMP and would apply to Alternative 3 as well. In spite of implementing the water demand mitigation measures, water demand impacts from Alterative 3 are expected to remain significant and equivalent to the 2012 AQMP and water quality impacts are expected to be less than significant and equivalent to the 2012 AQMP.

6.5.5.4.3 Project-specific and Cumulative Impacts Conclusion

Based on the above information, like the 2012 AQMP, Alternative 3 PM2.5 and ozone control measures are not expected to create significant adverse project-specific water quality impacts, but would be expected to generate water demand impacts equivalent to the 2012 AQMP. To ensure that water demand impacts remain significant, four mitigation measures were identified. Because Alternative 3 Control Measures ONRD-03 and OFFRD-01 would affect more on- and off-road sources than the comparable measures in the 2012 AQMP, project-specific impacts would be expected to be greater than impacts from the 2012 AQMP, but still less than significant.

Since, anticipated project-specific hydrology and water quality impacts from Alternative 3 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific hydrology or water quality impacts would be significant and greater than those generated by the 2012 AQMP, Alternative 3 would contribute to significant adverse cumulative hydrology or water quality impacts generated by the 2012-2035 RTP/SCS. Since hydrology and water quality impacts from Alternative 3 are cumulatively considerable, cumulative hydrology and water quality impacts from Alternative 3 are significant and greater than cumulative hydrology and water quality impacts from the 2012 AQMP.

6.5.5.5 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.4, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter. For the complete analysis of hydrology and water quality impacts from 2012 AQMP PM2.5 control measures, refer to Subchapter 4.5 – Hydrology and Water Quality. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2. As a result, impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1. Potential hydrology and water quality impacts from implementing Alternative 4 are described in the following subsections.

6.5.5.5.1 PM2.5 Control Measures

Because Alternative 4 contains all of the same PM2.5 control measures as the 2012 AQMP, it has the potential generate the same hydrology and water quality impacts. Potential hydrology and water quality impacts associated with Alternative 4 PM2.5 control measures (e.g., BCM-03, IND-01, MCS-01, etc.) were analyzed and the following impacts were identified: water demand and wastewater discharge from operating wet ESPs or wet scrubbers, water quality impacts from the use of alternative fuels and fuel additives, water demand and water quality impacts from wastewater discharges from increased use of water-based formulations. Of the potential hydrology and water quality impacts analyzed, water demand impacts associated with the manufacture and use of waterborne and add-on air pollution control technologies were concluded to be significant. While mitigation measures are available, they can vary from jurisdiction to jurisdiction, and may remain significant. The hydrology and water quality impacts associated with wastewater generation and related wastewater quality are less than significant. Further, the use and application of SBS (BCM-04) on water quality is also expected to be less than significant. Consequently, water demand impacts from Alternative 4 PM2.5 control measures are the same as water demand impacts from 2012 AQMP PM2.5 controls and are concluded to be significant.

6.5.5.5.2 Ozone Control Measures

Water demand impacts associated with Alternative 4 ozone control measures (CTS-01, CTS-02, CTS-03, CTS-04, and FUG-01) are potentially significant for water demand. Under Alternative 4, water quality impacts associated with wastewater generation and related wastewater quality from the same 2012 AQMP ozone control measures (see Subsection 6.5.5.1.2) are less than significant. Similarly, under Alternative 4 no significant adverse hydrology and water quality impacts are expected from the increased use of alternative fuels (see Subsection 6.5.5.1.2). No significant adverse water quality impacts associated with increase battery use in EV and hybrid vehicles are expected (see Subsection 6.5.5.1.2). Potential spills associated with ammonia are expected to be contained on-site due to the requirement for secondary spill containment devices and berms. Therefore, potential ammonia spills are expected to be less than significant.

6.5.5.5.3 *Project-specific and Cumulative Impacts Conclusion*

Because Alternative 4 does not specifically include any ozone control measures, like Alternative 1, it relies on the ozone portion of the 2007 AQMP. It was concluded in the 2007 Program EIR that water quality impacts from implementing all 2007 AQMP control measures would not be significant. However, the mitigation measures HWQ1, HWQ2, and HWQ3 were identified to ensure that water quality impacts would remain less than significant (see Subsection 6.5.5.2.3 for a description of these control measures).

Because Control Measure SCLTM-03 contributed to water quality impacts identified in the 2007 AQMP, the same mitigation measures would continue to be applicable under Alternative 4.

Potentially significant water quality impacts from illegal disposal of spent batteries resulting in battery acid leaking into the environment were also identified in the 2007 AQMP. As a result, mitigation measures HWQ4 and HWQ5 were identified to mitigate this type of potential water quality impact. It was concluded that implementing these two mitigation measures would reduce potential water quality impacts from illegal disposal of spent batteries to less than significant. However, because no 2007 AQMP black box control measures contributed to this water quality impact, the mitigation measures are no longer applicable. As indicated in Chapter 2 of this Final Program EIR, the SCAQMD and CARB have adopted all short-term control measures within their authority, so that only black box control measures remain. Since Alternative 4 does not include short-term control measures, potential hydrology and water quality materials impacts would be even less compared to the 2007 AQMP when it was originally adopted. Consequently, overall hydrology and water quality impacts from Alternative 4 are concluded to be less than significant and less than hydrology and water quality impacts from the 2012 AQMP.

Since, anticipated project-specific hydrology and water quality impacts from Alternative 4 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific hydrology or water quality (water demand) impacts would be significant, but less than those generated by the 2012 AQMP, Alternative 4 would contribute to significant adverse cumulative hydrology or water quality impacts generated by the 2012-2035 RTP/SCS. Since hydrology and water quality impacts from Alternative 4 are cumulatively considerable, cumulative hydrology and water quality impacts from Alternative4 are significant, but are less than significant cumulative hydrology and water quality impacts from the 2012 AQMP.

6.5.6 Land Use and Planning

The potential direct and indirect land use and planning impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of direct and indirect land use and planning impacts from each alternative relative to the 2012 AQMP.

6.5.6.1 Proposed Project

Potential direct and indirect land use and planning impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.6 - Land Use and Planning.

6.5.6.1.1 PM2.5 Control Measures

The analysis in Subchapter 4.6 indicated that no 2012 AQMP PM2.5 control measures were identified that have the potential to significantly adversely affect land use and planning decisions by local land use agencies. Therefore, potential impacts to land use and planning are concluded to be less than significant.

6.5.6.1.2 Ozone Control Measures

The analysis in Subchapter 4.6 identified the following 2012 AQMP ozone control measures as having the potential to create significant adverse land use and planning impacts, including visual impacts and impacts to scenic highways, ozone Control Measures ONRD-05, ADV-01, and ADV-2. These control measures identify construction of "wayside" power (such as electricity from overhead wires) as one of the zero emission technologies that could be used to reduce emissions from heavy-duty trucks and locomotives. Wayside power technologies include overhead catenary lines, where power is delivered from the electrical grid through the overhead wire to a pantograph on the vehicle itself. Catenary systems are well-established and efficient in light-rail applications, trolley cars and buses, and even mining trucks.

Control Measure ADV-01 indicates that the I-710 corridor was selected as high priority for introduction of zero-emission technology[6]. The 2012-2035 RTP/SCS also designates a route along the State Route 60 freeway as an east-west freight corridor[7]. In addition, there is currently a pilot project under consideration to install catenary lines at one of two sites, a site along the Terminal Island Freeway and on Navy at the Port of Los Angeles. Construction activities to install catenary lines at these locations would be expected to occur along heavily travelled roadways such as those identified above and possibly on other roads near the ports, such as Sepulveda Boulevard, Terminal Island Freeway, and Alameda Street.

Installation of electric and/or magnetic infrastructure will not change the existing condition (i.e., there will be limited opportunities to cross these major transportation corridors); however, the installation of the electric and/or magnetic infrastructure is not expected to create any new barriers or physically divide an established community. Further, the electric and/or magnetic infrastructure would be expected to be construction within or adjacent to the existing rights-of-way of existing streets and freeways, so no conflict with existing land

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6 Los Angeles County Metropolitan Transportation Authority, *Alternative Goods Movement Technology Analysis-Initial Feasibility Study Report, Final Report: I-710 Corridor Project EIR/EIS*. Prepared by URS. January 6, 2009.

7 Los Angeles County Metropolitan Transportation Authority, *Alternative Goods Movement Technology Analysis-Initial Feasibility Study Report, Final Report: I-710 Corridor Project EIR/EIS*. Prepared by URS. January 6, 2009.

uses, general plans, specific plans, local coastal program, zoning ordinance, or other policies would be expected. Therefore, land use and planning impacts from the 2012 AQMP are concluded to be less than significant.

6.5.6.1.3 Project-specific and Cumulative Impacts Conclusion

Overall, it was concluded in Subchapter 4.6 that 2012 AQMP control measures are not expected to conflict with applicable land use plans, policies, or regulations or physically divide an established community. Therefore, no significant adverse project-specific land use impacts are expected.

Since, anticipated project-specific land use and planning impacts from the 2012 AQMP are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific land use and planning impacts from the 2012 AQMP were evaluated in connection with land use and planning impacts from SCAG's 2012-2035 RTP/SCS. Further, since project-specific land use and planning impacts would be less than significant for the 2012 AQMP, the 2012 AQMP would not contribute to significant adverse cumulative land use and planning impacts generated by the 2012-2035 RTP/SCS. Since aesthetics impacts from the 2012 AQMP are not cumulatively considerable, cumulative aesthetics impacts from the 2012 AQMP are not significant.

6.5.6.2 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final Program EIR, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. The only remaining control measures are the black box measures. Since the 2007 AQMP now includes only black box measures, land use and planning impacts for Alternative 1 will focus only on potential impacts identified for the black box measures. Potential land use and planning impacts from implementing Alternative 1 are described in the subsection.

6.5.6.2.1 PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason and the fact that land use and planning was not an environmental topic identified in the NOP/IS for the 2007 AQMP that could be adversely affected by that AQMP, Alternative 1 is not expected to create any land use and planning impacts.

6.5.6.2.2 Ozone Control Measures

All remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. The analysis of potential land use and planning impacts from the 2012 AQMP was not originally identified as a topic that would be adversely affected by the 2012 AQMP. However, public comments received on the 6/28/12 NOP/IS requested that land use and planning be added to the analysis of impacts in the 2012

AQMP Final Program EIR because it was suggested that construction and operation fixed guideway systems contemplated as part of Control Measure ONRD-05 "may impact established communities."

As shown in Table 6-4, like Control Measure ONRD-05, 2007 AQMP Control Measure Off-Road Vehicles (SCLTM-02) would also regulate heavy-duty trucks using control technologies such as: expanded modernization and retrofit of heavy-duty trucks and buses; expanded inspection and maintenance program; and advanced near-zero and zero-emitting cargo transportation technologies. However, fixed guideway systems were not identified as a possible method of reducing heavy-duty truck emissions. The NOP/IS for the 2007 AQMP concluded that since the 2007 AQMP did not require construction of structures or new land uses in any areas of the district, no land use and planning impacts would be generated and land use and planning impacts would be less than would occur for the 2012 AQMP.

6.5.6.2.3 Project-specific and Cumulative Impacts Conclusion

The NOP/IS for the 2007 AQMP concluded that the 2007 AQMP would not generate any land use and planning impacts. Therefore, consistent with the assumptions in Subsection 6.5.1.2.1, it is presumed that Alternative 1 would not generate significant adverse project-specific land use and planning impacts.

Since, anticipated project-specific land use and planning impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific land use and planning impacts would be less than those generated by the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative land use and planning impacts generated by the 2012-2035 RTP/SCS. Since land use and planning impacts from Alternative 1 are not cumulatively considerable, cumulative land use and planning impacts from Alternative 1 are not significant and would be less than cumulative land use and planning impacts from the 2012 AQMP.

6.5.6.3 Alternative 2 – Localized PM Emissions Control

As explained in Subsection 6.4.2, with the exception of the two episodic PM2.5 control measures for Mira Loma, CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS) and CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), and one episodic ozone control measure, CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. As explained in the following subsections, potential land use and planning impacts from implementing Alternative 2 would be the same as potential land use and planning impacts from implementing the 2012 AQMP. For the complete analysis of land use and planning impacts from the 2012 AQMP, refer to Subchapter 4.6 – Land Use and Planning. Potential land use and planning impacts from implementing Alternative 2 are described in the following subsections.

6.5.6.3.1 PM2.5 Control Measures

Similar to the analysis of land use and planning impacts for the 2012 AQMP in Subchapter 4.6, no PM2.5 control measures were identified from implementing Alternative 2 that have the potential to significantly adversely affect land use and planning by local land use agencies. The three episodic control measures in this alternative that would apply only to the Mira Loma area do not contain any provisions for constructing wayside electricity such as catenary electric lines. Therefore, potential land use and planning impacts from implementing 2012 AQMP PM2.5 control measures were concluded to be less than significant. This same conclusion applies to Alternative 2.

6.5.6.3.2 Ozone Control Measures

Because Alternative 2 contains the same ozone control measures as the 2012 AQMP, except that ozone Control Measure CMALT-2A (similar to 2012 Control Measure ONRD-04) applies only to the Mira Loma area, land use and planning impacts from implementing Alternative 2 ozone control measures would be the same as the land use and planning impacts from implementing the 2012 AQMP ozone control measures. As shown in the analysis of land use and planning impacts for the 2012 AQMP in Subchapter 4.6, implementing ozone control measures from Alternative 2 (e.g., ozone Control Measures ONRD-05, ADV-01, and ADV-2) has the potential to generate adverse land use and planning impacts, such impacts would be less than significant. No other 2012 AQMP ozone control measures were identified that could affect land use and planning. This same conclusion applies to Alternative 2 because it contains the same three ozone control measures that have the potential to affect aesthetics resources.

6.5.6.3.3 Project-specific and Cumulative Impacts Conclusion

Overall, potential project-specific adverse land use and planning impacts from Alternative 2 would be the same as potential project-specific land use and planning impacts from the 2012 AQMP and less than significant, because construction of the catenary or overhead power lines would not expected to conflict with applicable land use plans, policies, or regulations or physically divide an established community.

Since, anticipated project-specific land use and planning impacts from Alternative 2 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific land use and planning impacts would be less than those generated by the 2012 AQMP, Alternative 2 would not contribute to significant adverse cumulative land use and planning impacts generated by the 2012-2035 RTP/SCS. Since land use and planning impacts from Alternative 2 are not cumulatively considerable, cumulative land use and planning impacts from Alternative 2 are not significant and equivalent to the 2012 AQMP.

6.5.6.4 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except it does not include 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP

Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. As explained in the following subsections, potential land use and planning impacts from implementing Alternative 3 would be the same as potential land use and planning impacts from implementing the 2012 AQMP. For the complete analysis of land use and planning impacts from the 2012 AQMP, refer to Subchapter 4.6 – Land Use and Planning.

6.5.6.4.1 PM2.5 Control Measures

Similar to the analysis of land use and planning impacts for the 2012 AQMP in Subchapter 4.6, no PM2.5 control measures were identified from implementing Alternative 3 that have the potential to significantly adversely affect land use and planning by local land use agencies. Potential land use and planning impacts from implementing the 2012 AQMP were concluded to be less than significant (see Subchapter 4.6 of this Final Program EIR). This same conclusion applies to Alternative 3.

6.5.6.4.2 Ozone Control Measures

Similar to the analysis of land use and planning impacts for the 2012 AQMP in Subchapter 4.1, implementing ozone control measures from Alternative 3 (e.g., ozone Control Measures ONRD-05, ADV-01, and ADV-2) has the potential to generate adverse land use and planning impacts. No other 2012 AQMP ozone control measures were identified that could affect land use and planning by local land use agencies. This same conclusion applies to Alternative 3 because it contains the same three ozone control measures that have the potential to generate land use and planning impacts. Consequently, land use and planning impacts from Alternative 3 would be the same as for the 2012 AQMP and both would be less than significant.

6.5.6.4.3 Project-specific and Cumulative Impacts Conclusion

As explained above, potential project-specific adverse land use and planning impacts from implementing Alternative 3 PM2.5 and ozone control measures would be the same as potential project-specific land use and planning impacts from implementing 2012 AQMP PM2.5 and ozone control measures and less than significant.

Since, anticipated project-specific land use and planning impacts from Alternative 3 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific land use and planning impacts would be less than those generated by the 2012 AQMP, Alternative 3 would not contribute to significant adverse cumulative land use and planning impacts generated by the 2012-2035 RTP/SCS. Since land use and planning impacts from Alternative 3 are not cumulatively considerable, cumulative land use and planning impacts from Alternative 3 are not significant and equivalent to the 2012 AQMP.

6.5.6.5 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.4, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter. For the complete analysis of land use and planning impacts from 2012 AQMP PM2.5 control measures, refer to Subchapter 4.6 – Land Use and Planning. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2. As a result, impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1. Potential land use and planning impacts from implementing Alternative 4 are described in the following subsections.

6.5.6.5.1 PM2.5 Control Measures

Similar to the analysis of land use and planning impacts for the 2012 AQMP in Subchapter 4.6, no PM2.5 control measures were identified from implementing Alternative 4 that have the potential to significantly adversely affect land use and planning by local land use agencies. Potential land use and planning impacts from implementing the 2012 AQMP were concluded to be less than significant (see Subchapter 4.6 of this Final Program EIR). This same conclusion applies to Alternative 4.

6.5.6.5.2 Ozone Control Measures

Adopting Alternative 4 means that the ozone SIP portion of the 2007 AQMP would remain in effect. As shown in Table 6-2 and discussed in subsection 6.5.1.2.3, 2012 AQMP Control Measure ONRD-05 would regulate the same emissions sources as 2007 AQMP Control Measure On-road Heavy-duty Vehicles (SCLTM-01B) (e.g., heavy-duty trucks using control technologies such as: expanded modernization and retrofit of heavy-duty trucks and buses; expanded inspection and maintenance program; and advanced near-zero and zero-emitting cargo transportation technologies). However, catenary systems were not identified as a possible method of reducing heavy-duty truck emissions. In fact, it was concluded in the NOP/IS for the 2007 AQMP that some control measures may have beneficial effects on scenic resources by improving visibility as well as improving air quality, preventing smoke, limiting opening burning and wood burning; and minimizing fugitive dust emissions. Therefore, it is concluded that Alternative 4 does not have the potential to generate significant adverse aesthetics impacts.

6.5.6.5.3 Project-specific and Cumulative Impacts Conclusion

Based upon the above conclusions, when considering overall land use and planning impacts from implementing Alternative 4, no significant adverse land use and planning impacts were identified from implementing PM2.5 or ozone control measures. Therefore, it is presumed that Alternative 4 would not generate significant adverse land use and planning impacts. Finally, it is concluded that potential adverse land use and planning impacts from implementing Alternative 4 would be less than for the 2012 AQMP because unlike the 2012 AQMP, Alternative 4 does not contain any control measures that adversely affect land use and planning.

Since, anticipated project-specific land use and planning impacts from Alternative 4 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific land use and planning impacts would be less than those generated by the 2012 AQMP and less than significant, Alternative 4 would not contribute to significant adverse cumulative land use and planning impacts generated by the 2012-2035 RTP/SCS. Since land use and planning impacts from Alternative 4 are not cumulatively considerable, cumulative land use and planning impacts from Alternative 4 are not significant and less than the 2012 AQMP.

6.5.7 Noise

The potential direct and indirect noise impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of direct and indirect noise impacts from each alternative relative to the 2012 AQMP.

6.5.7.1 Proposed Project

Potential direct and indirect noise impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.7 - Noise.

6.5.7.1.1 PM2.5 Control Measures

The analysis in Subchapter 4.7 identified three 2012 AQMP PM2.5 control measures, BCM-03, IND-01, and MCS-01 that have the potential to generate the adverse construction noise/vibration impacts. The analysis of noise impacts in Subchapter 4.7 indicated that three control measures identified here may result in construction activities associated with air pollution control equipment and other control strategies that could generate construction noise/vibration impacts. However, potential adverse construction noise/vibration impacts from implementing PM2.5 control measures were concluded to be less than significant because construction noise/vibration impacts associated with installing control equipment would occur within appropriately zoned industrial and commercial areas, impacts would be temporary and limited to construction activities, and construction noise/vibration impacts to sensitive receptors would not be expected.

6.5.7.1.2 Ozone Control Measures

The analysis in Subchapter 4.7 identified a number of 2012 AQMP ozone control measures as having the potential to create the following adverse construction noise/vibration impacts. Ozone control measures from the 2012 AQMP have the potential to generate adverse noise impacts as a result of construction activities associated with: installing emission control technologies onto stationary source equipment; installing battery charging or fueling infrastructures, as well as transportation infrastructure, constructing wayside power, catenary lines or other similar technologies. Potential noise/vibration impacts of the ozone control measures during the construction phases were determined to be significant. Nine mitigation measures (see Subchapter 4.7, Section 4.7.5) were identified to reduce potential construction noise/vibration, however, construction noise/vibration impacts could remain significant in areas where sensitive receptors are located near transportation corridors.

6.5.7.1.3 Project-specific and Cumulative Impacts Conclusion

It was concluded in Subchapter 4.7 that potential construction noise/vibration impacts from implementing 2012 AQMP PM2.5 control measures would be significant. However, in spite of identifying construction noise/vibration mitigation measures, potential construction noise/vibration impacts were concluded to remain significant. Therefore, project-specific construction noise/vibration impacts associated with the 2012 AQMP are concluded to be significant.

Since, anticipated project-specific construction noise/vibration impacts from the 2012 AQMP are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific noise and vibration impacts from the 2012 AQMP were evaluated in connection with noise and vibration impacts from SCAG's 2012-2035 RTP/SCS. Further, since project-specific construction noise and vibration impacts would be significant, the 2012 AQMP would contribute to significant adverse cumulative noise and vibration impacts generated by the 2012-2035 RTP/SCS. Since construction noise/vibration impacts from the 2012 AQMP are cumulatively considerable, cumulative construction noise/vibration impacts from the 2012 AQMP are significant.

6.5.7.2 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final Program EIR, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. The only remaining control measures are the black box measures. Since the 2007 AQMP now includes only black box measures, environmental impacts for Alternative 1 will focus only on potential impacts identified for the black box measures.

6.5.7.2.1 PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason and the fact that noise was not an environmental topic identified in the NOP/IS for the 2007 AQMP that could be adversely affected by that AQMP, Alternative 1 is not expected to create any noise impacts.

6.5.7.2.2 Ozone Control Measures

All remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. The analysis of potential noise impacts from the 2012 AQMP was not originally identified as a topic that would be adversely affected by the 2012 AQMP. However, public comments received on the 6/28/12 NOP/IS requested that noise impacts be added to the analysis of impacts in the 2012 AQMP Final Program EIR because of the potential for noise impacts "from the construction and operation of control measures in support of the 2012 AQMP. In particular it was asserted that construction and operation of Control Measure ONRD-05 could create potential noise impacts to nearby sensitive receptors.

As shown in Table 6-4, most Alternative 1 control measures would regulate mobile sources, although there is one control measure that would regulate consumer products. These control measures do not typically require construction activities and it is unlikely that operation would noticeably affect noise levels because control technologies that control emissions from mobile sources do not typically have movable parts that could generate noise.

Like Control Measure ONRD-05, 2007 AQMP Control Measure Off-Road Vehicles (SCLTM-02) would also regulate heavy-duty trucks using control technologies such as: expanded modernization and retrofit of heavy-duty trucks and buses; expanded inspection and maintenance program; and advanced near-zero and zero-emitting cargo transportation technologies. However, fixed guideway systems were not identified as a possible method of reducing heavy-duty truck emissions. The NOP/IS for the 2007 AQMP concluded that installing air pollution control equipment would not substantially increase ambient [operational] noise levels in the area, either permanently or intermittently, or expose people to excessive noise levels that would be noticeable above and beyond existing ambient levels. Further, it was not expected that affected facilities would exceed noise standards established in local general plans, noise elements, or noise ordinances currently in effect. Consequently noise impacts from Alternative 1 would not be significant and would be less than the 2012 AQMP.

6.5.7.2.3 Project-specific and Cumulative Impacts Conclusion

As a result, the NOP/IS for the 2007 AQMP concluded that the 2007 AQMP would not generate any noise impacts. Therefore, consistent with the assumptions in Subsection 6.4.1, it is presumed that Alternative 1 would not generate significant adverse noise impacts.

Since, anticipated project-specific noise impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific noise and vibration impacts would be less than those generated by the 2012 AQMP, would be less than significant and less than the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative noise and vibration impacts generated by the 2012-2035 RTP/SCS. Since noise impacts from Alternative 1 are not cumulatively considerable, cumulative noise impacts from Alternative 1 are not significant and less than noise impacts from the 2012 AQMP.

6.5.7.3 Alternative 2 – Localized PM Emissions Control

As explained in Subsection 6.4.2, with the exception of the two episodic PM2.5 control measures for Mira Loma, CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS) and CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), and one episodic ozone control measure, CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. As explained in the following subsections, potential noise impacts from implementing Alternative 2 would be the same as potential noise impacts from implementing the 2012 AQMP. For the complete analysis of solid and hazardous waste impacts from the 2012 AQMP, refer to Subchapter 4.7 – Noise. Potential noise impacts from implementing Alternative 2 are described in the following subsections.

6.5.7.3.1 PM2.5 Control Measures

Similar to the analysis of construction noise/vibration impacts for the 2012 AQMP in Subchapter 4.7, none of the three PM2.5 control measures in the 2012 AQMP that regulates the same sources as the episodic control measures in Alternative 2 was identified as contributing to construction noise/vibration impacts. However, because all other 2012 AQMP PM2.5 control measures, including those contributing to adverse construction noise/vibration impacts, are also included in Alternative 2, it has the potential to generate the same construction noise/vibration impacts as implementing the 2012 AQMP, which were concluded to be less than significant. This same conclusion applies to Alternative 2.

6.5.7.3.2 Ozone Control Measures

Because Alternative 2 contains the same ozone control measures as the 2012 AQMP, except that ozone Control Measure CMALT-2A (similar to 2012 control measure ONRD-04) applies only to the Mira Loma area, potential construction noise/vibration impacts from implementing Alternative 2 ozone control measures would be the same as the solid and hazardous waste impacts from implementing the 2012 AQMP ozone control measures (e.g., noise from construction activities associated with: installing emission control technologies onto stationary source equipment; installing battery charging or fueling infrastructures, as well as transportation infrastructure, constructing wayside power, catenary lines or other similar technologies). Similar to the significance determination for potential construction noise/vibration impacts of the ozone control measures from the 2012 AQMP, construction noise/vibration during construction phases under Alternative 2 would also be significant. The nine mitigation measures (see Subchapter 4.7, Section 4.7.5) identified to reduce potential construction noise/vibration impacts from the 2012 ozone control measures would continue to apply to Alternative 2; however, construction noise/vibration impacts could remain significant in areas where sensitive receptors are located near transportation corridors.

6.5.7.3.3 Project-specific and Cumulative Impacts Conclusion

Overall, potential construction noise/vibration impacts from implementing Alternative 2 PM2.5 control measures would be less than significant. However, implementing Alternative 2 ozone control measures could generate significant adverse construction noise/vibration impacts. In spite of applying construction noise/vibration mitigation measures, potential construction noise/vibration impacts were concluded to be significant. Therefore, project-specific construction noise/vibration impacts associated with Alternative 2 are concluded to be significant.

Since, anticipated project-specific construction noise/vibration impacts from Alternative 2 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific noise and vibration impacts would be significant and approximately equivalent to those generated by the 2012 AQMP, Alternative 2 would contribute to significant adverse cumulative noise and vibration impacts generated by the 2012-2035 RTP/SCS. Since construction noise/vibration impacts from the Alternative 2 are cumulatively considerable, cumulative construction noise/vibration impacts from the Alternative 2 are significant and equivalent to the 2012 AQMP.

6.5.7.4 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except it does not include 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. As explained in the following subsections, potential noise impacts from implementing Alternative 3 would be the same as potential noise impacts from implementing the 2012 AQMP. For the complete analysis of noise impacts from the 2012 AQMP, refer to Subchapter 4.7 – Noise.

6.5.7.4.1 PM2.5 Control Measures

Similar to the analysis of construction noise/vibration impacts for the 2012 AQMP in Subchapter 4.7, no PM2.5 control measures were identified from implementing Alternative 3 that have the potential to generate significant adverse construction noise/vibration impacts. Potential construction noise/vibration impacts from implementing the 2012 AQMP were concluded to be less than significant (see Subchapter 4.7 of this Final Program EIR). This same conclusion applies to Alternative 3.

6.5.7.4.2 Ozone Control Measures

All ozone control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 ozone control measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (750 trucks per year that would be diesel or diesel-hybrids that comply with the year 2010 exhaust emission standards and 250 trucks per year that would use CNG engines for a total of 1,000 trucks per year). Alternative 3 ozone Control Measure OFFRD-01 was evaluated and it was concluded that it did not have the potential to generate noise impacts.

The analysis of the 2012 AQMP ozone control measures, including Control Measure ONRD-03, indicated that the 2012 AQMP has the potential to create adverse noise impacts as a result of construction activities associated with: installing emission control technologies onto stationary source equipment; installing battery charging or fueling infrastructures, as well as transportation infrastructure, constructing wayside power, catenary lines or other similar technologies. Potential noise/vibration impacts of the ozone control measures during the construction phases were determined to be significant. Although Alternative 3 ozone Control Measure ONRD-03 is expected to double the number of trucks complying with the year 2010 engine exhaust standards, they would use the same sources of electricity as trucks under the 2102 AQMP. Consequently, no additional construction noise impacts would occur under Alternative since no additional sources of electricity would need to be constructed. Nine mitigation measures (see Subchapter 4.7, Section 4.7.5) were identified to reduce potential construction noise/vibration, however, construction noise/vibration impacts from Alternative 3 could remain significant in areas where sensitive receptors are located near transportation corridors and equivalent to the 2012 AQMP.

6.5.7.4.3 Project-specific and Cumulative Impacts Conclusion

Overall, potential construction noise/vibration impacts from implementing Alternative 3 PM2.5 control measures would be less than significant. However, implementing Alternative 3 ozone control measures could generate significant adverse construction noise/vibration impacts. In spite of applying construction noise/vibration mitigation measures, potential construction noise/vibration impacts were concluded to be significant. Therefore, project-specific construction noise/vibration impacts associated with Alternative 3 are concluded to be significant.

Since, anticipated project-specific construction noise/vibration impacts from Alternative 3 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific noise and vibration impacts would be significant and approximately equivalent to those generated by the 2012 AQMP, Alternative 3 would contribute to significant adverse cumulative noise and vibration impacts generated by the 2012-2035 RTP/SCS. Since construction noise/vibration impacts from the Alternative 3 are cumulatively considerable, cumulative construction noise/vibration impacts from the Alternative 3 are significant and equivalent to the 2012 AQMP.

6.5.7.5 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.4, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter. For the complete analysis of noise impacts from 2012 AQMP PM2.5 control measures, refer to Subchapter 4.7 – Noise. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2. As a result, impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1. Potential noise impacts from implementing Alternative 4 are described in the following subsections.

6.5.7.5.1 PM2.5 Control Measures

Similar to the analysis of construction noise/vibration impacts for the 2012 AQMP in Subchapter 4.7, no PM2.5 control measures were identified from implementing Alternative 4 that have the potential to generate significant adverse construction noise/vibration impacts. Potential construction noise/vibration impacts from implementing the 2012 AQMP were concluded to be less than significant (see Subchapter 4.7 of this Final Program EIR). This same conclusion applies to Alternative 4.

6.5.7.5.2 Ozone Control Measures

Adopting Alternative 4 means that the ozone SIP portion of the 2007 AQMP would remain in effect. The NOP/IS for the 2007 AQMP concluded that the 2007 AQMP may require existing commercial or industrial owners/operators of affected facilities to install air pollution control equipment or modify their operations to reduce stationary source emissions. Potential modifications would occur at facilities typically located in appropriately zoned industrial or commercial areas. Further, ambient noise levels in commercial and industrial areas are typically driven primarily by freeway and/or highway traffic in the area and any heavy-duty equipment used for materials manufacturing or processing at nearby facilities. It was concluded in the 2007 AQMP NOP/IS that, since modifications to install air pollution control equipment would not substantially increase ambient [operational] noise levels in the area, either permanently or intermittently or expose people to excessive noise levels that would be noticeable above and beyond existing ambient levels, noise impacts from the 2007 AQMP would be less than significant. Therefore, consistent with the assumptions in Subsection 6.4.1, it is presumed that implementing Alternative 4 ozone control measures would not generate significant adverse noise impacts and noise impacts would be less than noise impacts from the 2012.

6.5.7.5.3 Project-specific and Cumulative Impacts Conclusion

Based on the above information, implementing Alternative 4 PM2.5 control measures would not generate significant adverse noise impacts. As indicated in the 2007 AQMP NOP IS, the 2007 AQMP would not generate any adverse noise impacts. Therefore, consistent with the assumptions in Subsection 6.4.1, it is presumed that Alternative 4 would not generate significant adverse project-specific noise impacts, which means that noise impacts would be less than for the 2012 AQMP, which were concluded to be significant.

Since, anticipated project-specific noise impacts from Alternative 4 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific construction noise and vibration impacts would be less than significant and less than those generated by the 2012 AQMP, Alternative 4 would not contribute to significant adverse cumulative noise and vibration impacts generated by the 2012-2035 RTP/SCS. Since noise impacts from Alternative 4 are not cumulatively considerable, cumulative noise impacts from Alternative 4 are not significant and less than noise impacts from the 2012 AQMP.

6.5.8 Solid and Hazardous Waste

The potential direct and indirect solid and hazardous waste impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of direct and indirect aesthetics impacts from each alternative relative to the 2012 AQMP.

6.5.8.1 Proposed Project

Potential direct and indirect solid and hazardous waste impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.8 – Solid and Hazardous Waste.

6.5.8.1.1 PM2.5 Control Measures

The analysis in Subchapter 4.8 identified three 2012 AQMP PM2.5 control measures, BCM-03, IND-01, and MCS-01 that have the potential to generate the following adverse solid hazardous waste impacts. PM2.5 Control Measures BCM-01 and MCS-01 have the potential to generate solid waste associated with air pollution control equipment (e.g., filters). PM2.5 Control Measure IND-01 was also identified as having the potential generate solid waste impacts due to early retirement of equipment, solid was associated with air pollution control equipment, and EV battery disposal. However, potential adverse solid and hazardous waste impacts from implementing PM2.5 control measures were concluded to be less than significant.

6.5.8.1.2 Ozone Control Measures

The analysis in Subchapter 4.8 identified a number of 2012 AQMP ozone control measures as having the potential to create the following adverse solid and hazardous waste impacts. Potential solid and hazardous waste impacts from ozone control measures could occur due to burner replacement and SCR catalyst disposal. Similarly, potential solid and hazardous waste impacts from implementing ozone control measures from combustion equipment replacement, generation of solid waste from air pollution control equipment (e.g., used filters), and EV battery disposal. Finally, solid and hazardous waste impacts from implementing ozone control measures could potentially result in an increase in solid waste generation from early retirement of vehicles and EV battery disposal. However, potential adverse solid and hazardous waste impacts from implementing ozone control measures were concluded to be less than significant.

6.5.8.1.3 Project-specific and Cumulative Impacts Conclusion

Overall, it was concluded in Subchapter 4.8 that potential solid and hazardous waste impacts from implementing the 2012 AQMP would be less than significant. Therefore, project-specific solid and hazardous waste impacts associated with the 2012 AQMP are less than significant.

Since anticipated project-specific solid and hazardous waste impacts from the 2012 AQMP are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific solid and hazardous waste impacts from the 2012 AQMP were evaluated in connection with air quality impacts from SCAG's 2012-2035 RTP/SCS. Further, since project-specific solid and hazardous waste impacts would be less than significant, the 2012 AQMP would not contribute to significant adverse cumulative solid and hazardous waste impacts generated by the 2012-2035 RTP/SCS. Since solid and hazardous waste impacts from the 2012 AQMP are not cumulatively considerable, cumulative solid and hazardous waste impacts from the 2012 AQMP are not significant.

6.5.8.2 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final

Program EIR, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. The only remaining control measures are the black box measures. Since the 2007 AQMP now includes only black box measures, environmental impacts for Alternative 1 will focus only on potential impacts identified for the black box measures.

6.5.8.2.1 PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason, Alternative 1 is not expected to create any solid and hazardous waste impacts from PM2.5 control measures.

6.5.8.2.2 Ozone Control Measures

Potential impacts from adopting the 2007 AQMP were evaluated in the 2007 Program EIR. The 2007 Program EIR included an analysis of solid and hazardous waste impacts from all control measures, including black box control measures. As a result, consistent with the assumptions in Subsection 6.5.1.2 regarding the applicability of the significance determinations from the 2007 Program EIR, it is concluded that Alternative 1 does not have the potential to generate potentially significant solid and hazardous waste impacts as shown in Table 6-10 and described in the following paragraphs.

All remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. It was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-01 regulating on-road light-duty passenger vehicles and heavy-duty vehicles could generate potentially significant adverse solid and hazardous waste impacts. The reason for this conclusion was that accelerated penetration of low or zero emission vehicles could generate solid waste impacts from disposal of old batteries and replaced vehicles. This impact, however, was concluded to be less than significant.

Similarly, it was concluded in the Program EIR for the 2007 AQMP that the black box Control Measure SCLTM-02 regulating off-road heavy duty vehicles could also generate potentially significant adverse solid and hazardous waste impacts for the same reason identified for SCLTM-01 (e.g., accelerated penetration of low or zero emission vehicles could generate solid wasted impacts from disposal of old batteries and replaced vehicles). This impact, however, was concluded to be less than significant. Therefore, solid and hazardous waste impacts from Alternative 1 are less than significant and less than the solid and hazardous waste impacts from the 2012 AQMP.

6.5.8.2.3 Project-specific and Cumulative Impacts Conclusion

It was concluded in the 2007 Program EIR that all 2007 AQMP control measures would not generate significant adverse solid and hazardous waste impacts. As indicated in Subsection 6.4.1, the SCAQMD and CARB have adopted all short-term control measures within their authority, so that only black box control measures remain. Since Alternative 1 does not include short-term control measures, potential solid and hazardous waste impacts would be even less compared to the 2007 AQMP when it was originally adopted. Consequently, overall solid and hazardous waste impacts from Alternative 1 are concluded to be less than significant.

Since, anticipated project-specific solid and hazardous waste impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific solid and hazardous waste impacts would be less than significant and less than those generated by the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative solid and hazardous waste impacts generated by the 2012-2035 RTP/SCS. Since solid and hazardous waste impacts from Alternative 1 are not cumulatively considerable, cumulative solid and hazardous waste impacts from Alternative 1 are not significant and less than the solid and hazardous waste impacts from the 2012 AQMP.

6.5.8.3 Alternative 2 – Localized PM Emissions Control

As explained in Subsection 6.4.2, with the exception of the two episodic PM2.5 control measures for Mira Loma, CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS) and CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), and one episodic ozone control measure, CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. As explained in the following subsections, potential solid and hazardous waste impacts from implementing Alternative 2 would be the same as the potential solid and hazardous waste impacts from implementing the 2012 AQMP. For the complete analysis of the solid and hazardous waste impacts from the 2012 AQMP, refer to Subchapter 4.8 – Solid and Hazardous Waste. Potential solid and hazardous waste impacts from implementing Alternative 2 are described in the following subsections.

6.5.8.3.1 PM2.5 Control Measures

Similar to the analysis of solid and hazardous waste impacts for the 2012 AQMP in Subchapter 4.8, none of the three PM2.5 control measures in the 2012 AQMP that regulates the same sources as the episodic control measures in Alternative 2 was identified as contributing to solid and hazardous waste impacts. However, because all other 2012 AQMP PM2.5 control measures, including those contributing to adverse solid and hazardous waste impacts, are also included in Alternative 2, it has the potential to generate the same solid and hazardous waste impacts as implementing the 2012 AQMP, which were concluded to be less than significant. This same conclusion applies to Alternative 2.

6.5.8.3.2 Ozone Control Measures

Because Alternative 2 contains the same ozone control measures as the 2012 AQMP, except that ozone Control Measure CMALT-2A (similar to 2012 Control Measure ONRD-04) applies only to the Mira Loma area, potential solid and hazardous waste impacts from implementing Alternative 2 ozone control measures would be the same as the solid and hazardous waste impacts from implementing the 2012 AQMP ozone control measures. As shown in the analysis of solid and hazardous waste impacts for the 2012 AQMP in Subchapter 4.8, implementing ozone control measures from Alternative 2 (CMB-01, CMB-

02, CMB-03, INC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07), have the potential to generate adverse impacts to solid and hazardous waste impacts. No other 2012 AQMP ozone control measures were identified that could affect aesthetic resources. Such impacts associated with implementing the 2012 AQMP ozone control measures were concluded to be less than significant. This same conclusion applies to Alternative 2 because it contains the same ozone control measures identified above that have the potential to affect solid and hazardous waste resources.

6.5.8.3.3 Project-specific and Cumulative Impacts Conclusion

Overall, potential project-specific adverse solid and hazardous waste impacts from Alternative 2 would be the same as potential project-specific solid and hazardous waste impacts from the 2012 AQMP and less than significant, because wastes generated by Alternative 2 (e.g., spent batteries) are required to be, and are largely recycled. For equipment that may be retired before the end of its useful life, that equipment may be reused in areas outside the district.

Since, anticipated project-specific solid and hazardous waste impacts from Alternative 2 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific solid and hazardous waste impacts would be less than those than significant and approximately equivalent to those generated by the 2012 AQMP, Alternative 2 would not contribute to significant adverse cumulative solid and hazardous waste impacts generated by the 2012-2035 RTP/SCS. Since solid and hazardous waste impacts from Alternative 2 are not cumulatively considerable, cumulative solid and hazardous waste impacts from Alternative 2 are not significant and equivalent to the 2012 AQMP.

6.5.8.4 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except it does not include 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. As explained in the following subsections, potential solid and hazardous waste impacts from implementing Alternative 3 would be the same as potential solid and hazardous waste impacts from implementing the 2012 AQMP. For the complete analysis of solid and hazardous waste impacts from the 2012 AQMP, refer to Subchapter 4.8 – Solid and Hazardous Waste.

6.5.8.4.1 PM2.5 Control Measures

Similar to the analysis of solid and hazardous waste impacts for the 2012 AQMP in Subchapter 4.8, no PM2.5 control measures were identified from implementing Alternative 3 that have the potential to generate significant adverse solid and hazardous waste impacts. Potential solid and hazardous waste impacts from implementing the 2012 AQMP were concluded to be less than significant (see Subchapter 4.8 of this Final Program EIR). This same conclusion applies to Alternative 3.

6.5.8.4.2 Ozone Control Measures

Alternative 3 ozone control measures were evaluated for the potential to generate solid or hazardous wastes. The following potential solid or hazardous waste impacts were identified: combustion equipment replacement, generation of solid waste from air pollution control equipment (e.g., used filters), early retirement and replacement of on- and off-road vehicles, and EV battery disposal. The analysis concluded that Alternative 3 ozone control measure would not be expected to generate significant adverse solid and hazardous waste generation from the control measures evaluated (CMB-01, CMB-02, CMB-03, INC-01, ONRD-01, ONRD-02, ONRD-03, ONRD-04, ONRD-05, OFFRD-01, OFFRD-02, OFFRD-03, OFFRD-04, ADV-01, ADV-02, ADV-03, ADV-04, ADV-05, ADV-06, and ADV-07). The analysis indicated that the solid and hazardous waste impacts associated with spent batteries are required to be and are largely recycled. Further, for equipment that may be retired before the end of its useful life, it would likely be reused in areas outside the district. Equipment with no remaining useful life is expected to be recycled for metal content.

All ozone control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 ozone Control Measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (750 trucks per year that would be diesel or diesel-hybrids that comply with the year 2010 exhaust emission standards and 250 trucks per year that would use CNG engines for a total of 1,000 trucks per year). Similarly, Alternative 3 OFFRD-01 could result in a total of 19,344 additional repowered vehicles from the year 2014 through 2017. Although it is possible that Alternative 3 Control Measures ONRD-03 and OFFRD-01 could generate greater solid waste impacts than the 2012 AQMP, for the same reason identified above for the 2012 AQMP, solid waste impacts from Alternative 3 concluded to be less than significant.

6.5.8.4.3 Project-specific and Cumulative Impacts Conclusion

Overall, potential project-specific adverse solid and hazardous waste impacts from Alternative 3 would be greater than potential project-specific solid and hazardous waste impacts from the 2012 AQMP, but would still be less than significant, because wastes generated by Alternative 3 (e.g., spent batteries) are required to be, and are largely recycled. For equipment that may be retired before the end of its useful life, that equipment may be reused in areas outside the district.

Since, anticipated project-specific solid and hazardous waste impacts from Alternative 3 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Although project-specific solid and hazardous waste impacts would be less than significant, but greater than those generated by the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative solid and hazardous waste impacts generated by the 2012-2035 RTP/SCS. Since solid and hazardous waste impacts from Alternative 3 are not cumulatively considerable, cumulative solid and hazardous waste impacts from Alternative 3 are not significant and greater than those generated by the 2012 AQMP.

6.5.8.5 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.4, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter. For the complete analysis of solid and hazardous waste impacts from 2012 AQMP PM2.5 control measures, refer to Subchapter 4.8 – Solid and Hazardous Waste. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2. As a result, impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1. Potential solid and hazardous waste impacts from implementing Alternative 4 are described in the following subsections.

6.5.8.5.1 PM2.5 Control Measures

The analysis of 2012 AQMP PM2.5 control measures identified three 2012 AQMP PM2.5 control measures, BCM-03, IND-01, and MCS-01, that have the potential to generate the following adverse solid hazardous waste impacts. PM2.5 Control Measures BCM-01 and MCS-01 have the potential to generate solid waste associated with air pollution control equipment (e.g., filters). PM2.5 Control Measure IND-01 was also identified as having the potential generate solid waste impacts due to early retirement of equipment, solid was associated with air pollution control equipment, and EV battery disposal. However, potential adverse solid and hazardous waste impacts from implementing PM2.5 control measures were concluded to be less than significant. Because Alternative 4 includes all of the same PM2.5 control measures as the 2012 AQMP, solid and hazardous waste impacts would be the same.

6.5.8.5.2 Ozone Control Measures

Adopting Alternative 4 means that the ozone SIP portion of the 2007 AQMP would remain in effect. As shown in Table 6-2, there are a number 2012 AQMP ozone control measures that would regulate similar sources to those regulated by the remaining 2007 AQMP black box measures that have the potential to generate adverse solid and hazardous waste impacts (Table 6-22). However, the same reasons solid and hazardous waste impacts from the 2012 AQMP would be less than significant would apply to Alternative 4. Therefore, it is concluded that Alternative 4 does not have the potential to generate significant adverse solid and hazardous waste impacts and impacts would be less than solid and hazardous waste impacts from the 2012 AQMP because more ozone control measures with the potential to generate adverse solid and hazardous waste impacts were identified.

TABLE 6-22

Long-Term (Black Box) Control Measures from the 2007 AQMP

SOURCE CATEGORY	2012 AQMP CONTROL MEASURES AFFECTING SAME SOURCE
Light Duty Vehicles (SCLTM-01A)	ONRD-01 & ADV-01
On-Road Heavy Duty Vehicles (SCLTM-01B)	ONRD-03, ONRD-05 & ADV-06
Off-Road Vehicles (SCLTM-02)	OFFRD-01 & ADV-06
Marine Vessels	IND-01, OFFRD-05 & ADV-05
Locomotives	OFFRD-02, OFFRD-03 & ADV-02
Aircraft	ADV-07

6.5.8.5.3 Project-specific and Cumulative Impacts Conclusion

Based upon the above conclusions, when considering overall solid and hazardous waste impacts from implementing Alternative 4, although some 2007 black box measures have the potential to generate adverse solid and hazardous waste impacts, no significant adverse solid and hazardous waste impacts were identified from implementing PM2.5 or ozone control measures. Finally, it is concluded that potential adverse solid and hazardous waste impacts from implementing Alternative 4 would be less than for the 2012 AQMP because more ozone control measures with the potential to generate adverse solid and hazardous waste impacts were identified. As a result, Alternative 4 would not generate significant adverse solid and hazardous waste impacts and solid and hazardous waste impacts would be less than those from the 2012 AQMP.

Since, anticipated project-specific solid and hazardous waste impacts from Alternative 4 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific solid and hazardous waste impacts would be less than significant and less than those generated by the 2012 AQMP, Alternative 4 would not contribute to significant adverse cumulative solid and hazardous waste impacts generated by the 2012-2035 RTP/SCS. Since solid and hazardous waste impacts from Alternative 4 are not cumulatively considerable, cumulative solid and hazardous waste impacts from Alternative 4 are not significant and less than the 2012 AQMP.

6.5.9 Transportation and Traffic

The potential direct and indirect transportation and traffic impacts from implementing the proposed project and the project alternatives were evaluated. The following subsections provide brief discussions of direct and indirect hazards and hazardous materials impacts from each alternative relative to the 2012 AQMP.

6.5.9.1 Proposed Project

Potential direct and indirect transportation and traffic impacts from the 2012 AQMP are summarized in the following subsections. For the complete analysis, refer to Subchapter 4.9 – Transportation and Traffic.

6.5.9.1.1 PM2.5 Control Measures

The analysis in Subchapter 4.9 – Transportation and Traffic, indicated that no 2012 AQMP PM2.5 control measures were identified that have the potential to significantly adversely affect transportation and traffic. Therefore, potential impacts to transportation and traffic are concluded to be less than significant.

6.5.9.1.2 Ozone Control Measures

The analysis in Subchapter 4.9 identified the following three 2012 AQMP ozone control measures as having the potential to create significant adverse transportation and traffic impacts: ONRD-05, ADV-01, and ADV-02. It was determined that these three 2012 AQMP ozone control measures could generate potential traffic impacts due to construction and operation of wayside sources of electricity, such as overhead catenary lines; battery charging stations; alternative fuel fueling infrastructure; and magnetic infrastructure. The potential transportation and traffic impacts of these ozone control measures were determined to be significant and mitigation measures would be required. It is not feasible to identify project- and site-specific mitigation measures for future traffic and transportation projects in this Final Program EIR. Instead, appropriate project-specific mitigation measures would to be identified by the appropriate lead agency[8] in the CEQA/NEPA document prepared for each future project that may be proposed. However, standard traffic construction mitigation measures, such as a traffic management plan containing mitigation measures such as those identified in transportation traffic Subchapter 4.9 would likely be implemented[9]. The analysis of 2012 AQMP ozone control measures concluded that the potential exists for future traffic and transportation impacts to be significant and unavoidable (i.e., significant even after standard types of roadway construction mitigation measures are identified and imposed).

6.5.9.1.3 Project-specific and Cumulative Impacts Conclusion

Overall, it was concluded in Subchapter 4.9 that in spite of identifying a roadway construction mitigation measure, implementing 2012 AQMP ozone control measures has the potential to generate significant adverse traffic impacts from construction future wayside sources of energy. Although temporary in nature, traffic impacts during construction are still considered to be significant. Similarly, traffic impacts during the operation of roadways dedicated as truck lanes for vehicles using the overhead catenary electrical lines or fixed guideway systems are also considered to be significant because traffic patterns and

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[8] The SCAQMD has no jurisdiction over constructing and operating roadways.

[9] The traffic construction mitigation measure identified in Subchapter 4.9 is from SCAG's 2012 – 2035 RTP/SCS.

congestion may be adversely affected. Therefore, project-specific transportation and traffic impacts from implementing 2012 AQMP ozone control measures are concluded to be significant and unavoidable.

Since, anticipated project-specific transportation and traffic impacts from the 2012 AQMP are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). In Chapter 5 potential project-specific transportation and traffic impacts from the 2012 AQMP were evaluated in connection with transportation and traffic impacts from SCAG's 2012-2035 RTP/SCS. Further, since project-specific transportation and traffic impacts were concluded to be significant, the 2012 AQMP would contribute to significant adverse cumulative transportation and traffic impacts generated by the 2012-2035 RTP/SCS. Since transportation and traffic impacts from the 2012 AQMP are cumulatively considerable, cumulative transportation and traffic impacts from the 2012 AQMP are significant. No measures beyond that identified in Subchapter 4.9 were identified to mitigate significant adverse cumulative transportation and traffic impacts.

6.5.9.2 Alternative 1 – No Project Alternative

The Program EIR for the 2007 AQMP included environmental analyses for all control measures, including the black box control measures. As discussed in Chapter 2 of this Final Program EIR, all of the SCAQMD's and CARB's short- and mid-term control measures have been adopted. The only remaining control measures are the black box measures. Since the 2007 AQMP now includes only black box measures, environmental impacts for Alternative 1 will focus only on potential impacts identified for the black box measures.

6.5.9.2.1 PM2.5 Control Measures

As discussed in Subsection 6.4.1, Alternative 1 has no control measures that are considered to be PM2.5 control measures. For this reason and the fact that transportation and traffic was not an environmental topic identified in the NOP/IS for the 2007 AQMP that could be adversely affected by that AQMP, Alternative 1 is not expected to create any transportation and traffic impacts.

6.5.9.2.2 Ozone Control Measures

All remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. The analysis of potential transportation and traffic impacts from the 2012 AQMP was not originally identified as a topic that would be adversely affected by the 2012 AQMP. However, public comments received on the 6/28/12 NOP/IS requested that transportation and traffic impacts be added to the analysis of impacts in the 2012 AQMP Final Program EIR because of the potential for transportation and traffic impacts on major traffic corridors from the use of catenary systems that could affect heavy-duty truck lane choice by trucks and traffic flow patterns. The only control measures from the 2012 AQMP that include catenary systems as a means of reducing emissions are ONRD-05 and ADV-01.

As shown in Table 6-4, like Control Measures ONRD-05 and ADV-01, 2007 AQMP Control Measure On-road Heavy-duty Vehicles (SCLTM-01B) would also regulate heavy-duty trucks using control technologies such as: expanded modernization and retrofit of heavy-duty trucks and buses; expanded inspection and maintenance program; and advanced near-zero and zero-emitting cargo transportation technologies. However, fixed guideway systems were not identified as a possible method of reducing heavy-duty truck emissions. Consequently, implementing the black box measures of the 2007 AQMP would not generate any transportation and traffic impacts, so transportation and traffic impacts would be less than those for the 2012 AQMP.

6.5.9.2.3 Project-specific and Cumulative Impacts Conclusion

The NOP/IS for the 2007 AQMP concluded that, overall, controlling emissions at existing commercial or industrial facilities and establishing mobile source exhaust and fuel specifications would not impede traffic patterns in any way. Further, the 2007 AQMP included TCMS, which were expected to reduce vehicle trips and vehicle miles traveled and result in greater reliance on mass transit, ridesharing, telecommunications, etc., resulting in reduced traffic congestion, a beneficial effect. As a result, the NOP/IS for the 2007 AQMP concluded that the 2007 AQMP would not generate any transportation and traffic impacts. Therefore, consistent with the assumptions in Subsection 6.4.1, it is presumed that Alternative 1 would not generate significant adverse transportation and traffic impacts, which means that transportation and traffic impacts would be less than for the 2012 AQMP, which were concluded to be significant.

Since, anticipated project-specific transportation and traffic impacts from Alternative 1 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Although project-specific transportation and traffic impacts would be less than significant and less than those generated by the 2012 AQMP, Alternative 1 would not contribute to significant adverse cumulative transportation and traffic impacts generated by the 2012-2035 RTP/SCS. Since transportation and traffic impacts from Alternative 1 are not cumulatively considerable, cumulative transportation and traffic impacts from Alternative 1 are not significant.

6.5.9.3 Alternative 2 – Localized PM Emissions Control

As explained in Subsection 6.4.2, with the exception of the two episodic PM2.5 control measures for Mira Loma, CMALT-2B (formerly MCS-04B in the 6/28/12 NOP/IS) and CMALT-2C (formerly MCS-04C in the 6/28/12 NOP/IS), and one episodic ozone control measure, CMALT-2A (formerly MCS-04A in the 6/28/12 NOP/IS), Alternative 2 includes all of the same PM2.5 and ozone control measures as the 2012 AQMP, except for PM2.5 Control Measure BCM-02 – Open Burning. As explained in the following subsections, transportation and traffic impacts from implementing Alternative 2 would be the same as potential transportation and traffic impacts from implementing the 2012 AQMP. For the complete analysis of transportation and traffic impacts from the 2012 AQMP, refer to Subchapter 4.9 – Transportation and Traffic. Potential transportation and traffic impacts from implementing Alternative 2 are described in the following subsections.

6.5.9.3.1 PM2.5 Control Measures

Similar to the analysis of potential transportation and traffic impacts for the 2012 AQMP in Subchapter 4.9, no PM2.5 control measures were identified from implementing Alternative 2 that have the potential to significantly adversely affect transportation and traffic. The three episodic control measures in this alternative that would apply only to the Mira Loma area do not contain any provisions for constructing wayside electricity such as catenary electric lines. Therefore, potential transportation and traffic impacts from implementing 2012 AQMP PM2.5 control measures were concluded to be less than significant. This same conclusion applies to Alternative 2.

6.5.9.3.2 Ozone Control Measures

Because Alternative 2 contains the same ozone control measures as the 2012 AQMP, except that ozone Control Measure CMALT-2A (similar to 2012 Control Measure ONRD-04) applies only to the Mira Loma area, transportation and traffic impacts from implementing Alternative 2 ozone control measures would be the same as the transportation and traffic impacts from implementing the 2012 AQMP ozone control measures. As shown in the analysis of transportation and traffic impacts for the 2012 AQMP in Subchapter 4.9, implementing ozone control measures from Alternative 2 (e.g., ozone Control Measures ONRD-05, ADV-01, and ADV-2), has the potential to generate significant adverse transportation and traffic impacts from the construction and operation of wayside sources of electricity, such as overhead catenary lines; battery charging stations; alternative fuel fueling infrastructure; and magnetic infrastructure. Because implementing the three Alternative 2 ozone control measures identified above has the potential to generate significant adverse transportation and traffic impacts from constructing and operating of wayside sources of electricity, the standard traffic construction mitigation measure (e.g., the traffic management plan measures identified in the transportation and traffic Subchapter 4.9) would also apply to Alternative 2.

6.5.9.3.3 Project-specific and Cumulative Impacts Conclusion

Based on the above information, it is concluded that, in spite of identifying a roadway construction mitigation measure, implementing Alternative 2 ozone control measures has the potential to generate significant adverse traffic impacts from constructing future wayside sources of energy. Although temporary in nature, traffic impacts during construction are still considered to be significant. Similarly, traffic impacts during the operation of roadways dedicated as truck lanes for vehicles using the overhead catenary electrical lines or fixed guideway systems are also considered to be significant because traffic patterns and congestion may be adversely affected. Therefore, project-specific transportation and traffic impacts from implementing Alternative 2 ozone control measures are concluded to be significant and unavoidable and are equivalent to transportation and traffic impacts from the 2012 AQMP.

Since, anticipated project-specific transportation and traffic impacts from Alternative 2 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific transportation and traffic impacts would be significant and approximately equivalent to those generated by the 2012 AQMP, Alternative 2 would contribute to significant adverse cumulative transportation and traffic impacts generated by the 2012-2035 RTP/SCS. Since project-specific transportation and traffic impacts from Alternative 2 are cumulatively considerable, cumulative transportation and traffic impacts from Alternative 2 are significant and would be equivalent to transportation and traffic impacts from the 2012 AQMP. No measures beyond that identified in Subchapter 4.9 were identified to mitigate significant adverse cumulative transportation and traffic impacts.

6.5.9.4 Alternative 3 – Greater Reliance on NOx Emissions Reductions

As explained in Subsection 6.4.3, Alternative 3 includes all of the same PM2.5 control measures as the 2012 AQMP except it does not include 2012 AQMP Control Measure BCM-01. With regard to ozone control measures, with the exceptions of 2012 AQMP Control Measures ONRD-03 and OFFRD-01, all other ozone control measures are the same as those in the 2012 AQMP. As explained in the following subsections, potential transportation and traffic impacts from implementing Alternative 3 would be the same as potential transportation and traffic impacts from implementing the 2012 AQMP. For the complete analysis of transportation and traffic impacts from the 2012 AQMP, refer to Subchapter 4.9 – Transportation and Traffic.

6.5.9.4.1 PM2.5 Control Measures

Similar to the analysis of transportation and traffic impacts for the 2012 AQMP in Subchapter 4.9, no PM2.5 control measures were identified from implementing Alternative 3 that have the potential to significantly adversely affect transportation and traffic. Therefore, potential transportation and traffic impacts from implementing 2012 AQMP PM2.5 control measures were concluded to be less than significant. This same conclusion applies to Alternative 3.

6.5.9.4.2 Ozone Control Measures

All ozone control measures in Alternative 3 are identical to those in the 2012 AQMP, except that Alternative 3 ozone Control Measure ONRD-03 could result in approximately 5,000 additional medium-heavy-duty trucks complying with the year 2010 engine exhaust requirements for the years 2013 through 2017 (750 trucks per year that would be diesel or diesel-hybrids that comply with the year 2010 exhaust emission standards and 250 trucks per year that would use CNG engines for a total of 1,000 trucks per year) would comply with the 2010 on-road vehicle exhaust requirements using CNG engines and the rest would be diesel or diesel hybrid). Similarly, Alternative 3 OFFRD-01 could result in a total of 19,344 additional repowered vehicles from the year 2014 through 2017. Because the remaining Alternative 3 ozone control measures are the same as the 2012 AQMP, transportation and traffic impacts from implementing Alternative 3 ozone control measures would be the same as the transportation and traffic impacts from implementing the 2012 AQMP ozone control measures. As shown in the analysis of transportation and traffic impacts for the 2012 AQMP in Subchapter 4.9, implementing ozone control measures from Alternative 3 (e.g., ozone Control Measures ONRD-05 and ADV-01) has the potential to generate significant adverse transportation and traffic impacts from the construction and operation of wayside sources of electricity, such as overhead catenary lines; battery charging stations; alternative fuel fueling infrastructure; and magnetic infrastructure. Because implementing the two Alternative 3 ozone control measures identified above has the potential to generate significant adverse transportation and traffic impacts from constructing and operating of wayside sources of electricity, the standard traffic construction mitigation measure (e.g., the traffic management plan measures identified in the transportation and traffic Subchapter 4.9) would also apply to Alternative 3. In spite of implementing these traffic mitigation measures, transportation and traffic impacts from Alternative 3 remain significant and greater than the 2012 AQMP.

6.5.9.4.3 Project-specific and Cumulative Impacts Conclusion

Based on the above information, it is concluded that, in spite of identifying a roadway construction mitigation measure, implementing Alternative 3 ozone control measures has the potential to generate significant adverse traffic impacts from constructing future wayside sources of energy. Although temporary in nature, traffic impacts during construction are still considered to be significant. Similarly, traffic impacts during the operation of roadways dedicated as truck lanes for vehicles using the overhead catenary electrical lines or fixed guideway systems are also considered to be significant because traffic patterns and congestion may be adversely affected. Therefore, project-specific transportation and traffic impacts from implementing Alternative 3 ozone control measures are concluded to be significant and unavoidable and are equivalent to transportation and traffic impacts from the 2012 AQMP.

Since, anticipated project-specific transportation and traffic impacts from Alternative 3 are concluded to be significant, they are considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific transportation and traffic impacts would be significant and greater than those generated by the 2012 AQMP, Alternative 3 would contribute to significant adverse cumulative transportation and traffic impacts generated by the 2012-2035 RTP/SCS. Since transportation and traffic impacts from Alternative 3 are cumulatively considerable, cumulative transportation and traffic impacts from Alternative 3 are significant and greater than transportation and traffic impacts from the 2012 AQMP. No measures beyond that identified in Subchapter 4.9 were identified to mitigate significant adverse cumulative transportation and traffic impacts.

6.5.4.5 Alternative 4 – PM2.5 Reduction Strategies Only

As explained in Subsection 6.4.4, Alternative 4 would only include the PM2.5 control measures in Table 6-4 of this chapter. For the complete analysis of transportation and traffic impacts from 2012 AQMP PM2.5 control measures, refer to Subchapter 4.9 – Transportation and Traffic. Because Alternative 4 does not address attaining either the federal one-hour or eight-hour ozone standards, the ozone SIP portion of the 2007 AQMP would remain in effect, which includes only the black box measures in Table 6-2. As a result, impacts from implementing 2007 AQMP black box control measures would be the same as for Alternative 1. Potential transportation and traffic impacts from implementing Alternative 4 are described in the following subsections.

6.5.9.4.1 PM2.5 Control Measures

Similar to the analysis of transportation and traffic impacts for the 2012 AQMP in Subchapter 4.9, no PM2.5 control measures were identified from implementing Alternative 4 that have the potential to significantly adversely affect transportation and traffic. Therefore, potential transportation and traffic impacts from implementing 2012 AQMP PM2.5 control measures were concluded to be less than significant. This same conclusion applies to Alternative 4.

6.5.9.4.2 Ozone Control Measures

As already indicated, all remaining black box measures from the 2007 AQMP that comprise Alternative 1 are assumed to be ozone control measures. This assumption also applies to the ozone control measures of Alternative 4.

As shown in Table 6-4, like Control Measures ONRD-05 and ADV-01, 2007 AQMP Control Measure On-road Heavy-duty Vehicles (SCLTM-01B) would also regulate heavy-duty trucks using control technologies such as: expanded modernization and retrofit of heavy-duty trucks and buses; expanded inspection and maintenance program; and advanced near-zero and zero-emitting cargo transportation technologies. However, fixed guideway systems were not identified as a possible method of reducing heavy-duty truck emissions. Consequently, implementing the black box measures of the 2007 AQMP would not generate any transportation and traffic impacts.

6.5.9.4.3 Project-specific and Cumulative Impacts Conclusion

The NOP/IS for the 2007 AQMP concluded that, overall, controlling emissions at existing commercial or industrial facilities and establishing mobile source exhaust and fuel specifications would not impede traffic patterns in any way. Further, the 2007 AQMP included TCMs, which were expected to reduce vehicle trips and vehicle miles traveled and result in greater reliance on mass transit, ridesharing, telecommunications, etc., resulting in reduced traffic congestion, a beneficial effect. As a result, the NOP/IS for the 2007 AQMP concluded that the 2007 AQMP would not generate any transportation and traffic impacts. This conclusion also applies to Alternative 4, which means that transportation and traffic impacts from Alternative 4 would be less than for the 2012 AQMP, which were concluded to be significant.

Since, anticipated project-specific transportation and traffic impacts from Alternative 4 are concluded to be less than significant, they are not considered to be cumulatively considerable as defined in CEQA Guidelines §15064 (h)(1). Further, since project-specific transportation and traffic impacts would be less than significant and less than those generated by the 2012 AQMP, Alternative 4 would not contribute to significant adverse cumulative transportation and traffic impacts generated by the 2012-2035 RTP/SCS. Since transportation and traffic impacts from Alternative 4 are not cumulatively considerable, cumulative transportation and traffic impacts from Alternative 1 are not significant.

6.6 COMPARISON OF THE PROJECT ALTERNATIVES TO THE 2012 AQMP

Pursuant to CEQA Guidelines §15126.6 (d), "The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed." The sections above provide a comprehensive analysis of potential impacts generated by each project alternative and compares impacts to those generated by the 2012 AQMP. Table 6-23 provides a matrix displaying the major characteristics and significant environmental effects of each alternative compared to the 2012 AQMP.

TABLE 6-23

Comparison of the Project Alternatives to the Proposed 2012 AQMP

	PROJECT				
Environmental Topic	**2012 AQMP**	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Aesthetics					
PM2.5	**NS**	**NS (=)**	**NS (=)**	**NS (=)**	**NS (=)**
Ozone	**NS**	**NS (=)**	**NS (=)**	**NS (=)**	**NS (-)**
Cumulative	**NS**	**NS (=)**	**NS (=)**	**NS (=)**	**NS (-)**
Direct Air Quality Impacts - PM2.5 Attainment year					
	2014	**2019**	**2017**	**2017**	**2014**
Secondary Air Quality Impacts					
PM2.5 Construction	**S**	**NS (-)**	**S (=)**	**S (=)**	**S (=)**
PM2.5 Operation	**NS**	**NS (-)**	**NS (-)**	**NS (-)**	**NS (=)**
Ozone Construction	**S**	**NS (-)**	**S (=)**	**S (=)**	**NS (-)**
Ozone Operation	**NS**	**NS (-)**	**NS (-)**	**S (=)**	**NS (-)**
Cumulative	**S**	**NS (-)**	**S (-)**	**S (=)**	**NS (-)**

TABLE 6-23 (Continued)

Comparison of the Project Alternatives to the Proposed 2012 AQMP

	PROJECT				
Environmental Topic	**2012 AQMP**	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Energy					
PM2.5	**S**	**NS (-)**	**S (=)**	**S (=)**	**S (=)**
Ozone	**S**	**NS (-)**	**S (=)**	**S (+)**	**NS (-)**
Cumulative	**S**	**NS (-)**	**S (=)**	**S (+)**	**S (-)**
Hazards and Hazardous Materials					
PM2.5	**S**	**NS (-)**	**S (-)**	**S (=)**	**S (=)**
Ozone	**S**	**NS (-)**	**S (-)**	**S (+)**	**NS (-)**
Cumulative	**S**	**NS (-)**	**S (-)**	**S (+)**	**S (-)**
Hydrology and Water Quality					
PM2.5	**S**	**NS (-)**	**S (=)**	**S (=)**	**S (=)**
Ozone	**S**	**NS (-)**	**S (=)**	**S (=)**	**NS (-)**
Cumulative	**S**	**NS (-)**	**S (=)**	**S (=)**	**S (-)**
Land Use and Planning					
PM2.5	**NS**	**NS (-)**	**NS (=)**	**NS (=)**	**NS (=)**
Ozone	**NS**	**NS (-)**	**NS (=)**	**NS (=)**	**NS (-)**
Cumulative	**NS**	**NS (-)**	**NS (=)**	**NS (=)**	**NS (-)**
Noise					
PM2.5	**NS**	**NS (-)**	**NS (=)**	**NS (=)**	**NS (=)**
Ozone	**S**	**NS (-)**	**S (=)**	**S (=)**	**NS (-)**
Cumulative	**S**	**NS (-)**	**S (=)**	**S (=)**	**NS (-)**
Solid and Hazardous Waste					
PM2.5	**NS**	**NS (-)**	**NS (=)**	**NS (=)**	**NS (=)**
Ozone	**NS**	**NS (-)**	**NS (=)**	**NS (+)**	**NS (-)**
Cumulative	**NS**	**NS (-)**	**NS (=)**	**NS (+)**	**NS (-)**

TABLE 6-23 (Concluded)

Comparison of the Project Alternatives to the Proposed 2012 AQMP

	PROJECT				
Environmental Topic	**2012 AQMP**	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**
Traffic Transportation					
PM2.5	**NS**	**NS (-)**	**NS (=)**	**NS (=)**	**NS (=)**
Ozone	**S**	**NS (-)**	**S (=)**	**S (+)**	**NS (-)**
Cumulative	**S**	**NS (-)**	**S (=)**	**S (+)**	**NS (-)**

Notes:
S = Significant
NS = Not Significant
(-) = Potential impacts are less than the proposed project.
(+) = Potential impacts are greater than the proposed project.
(=) = Potential impacts are approximately the same as the proposed project.

6.7 ENVIRONMENTALLY SUPERIOR AND LOWEST TOXIC ALTERNATIVE

Pursuant to CEQA Guidelines §15126.6 (e)(2), if the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. Alternative 1 – No Project Alternative, continued implementation of the 2007 AQMP is considered to be the environmentally superior alternative because it is not expected to generate any significant adverse impacts to any environmental topic areas. Alternative 1 (the 2007 AQMP) was originally drafted to demonstrate compliance with the federal eight-hour ozone and PM2.5 standards and does not specifically address attaining the federal 24-hour PM2.5 standard. Although Alternative 1 would ultimately achieve the federal 24-hour PM2.5 standard by the year 2019, it is not clear at this point if it would be approvable by U.S. EPA.

Based on the above, since the No Project Alternative was deemed the environmentally superior alternative, an alternative from the remaining alternatives must be selected. Based on the analysis of potential impacts from each of the project alternatives, it is concluded that Alternative 4 – PM2.5 Emissions Reduction Strategies Only, is the environmentally superior alternative. This conclusion is based on the fact that the ozone portion of Alternative 4 relies on continued implementation of the ozone portion of the 2007 AQMP. The 2007 AQMP has fewer ozone control measures and the ozone control measures are less likely to cause significant adverse impacts because they do not affect as many sources or control technologies do not produce as many secondary impacts.

In accordance with SCAQMD's policy document Environmental Justice Program Enhancements for FY 2002-03, Enhancement II-1 recommends that all SCAQMD CEQA documents required to include an alternatives analysis, also include and identify a feasible project alternative with the lowest air toxics emissions. In other words, for any major equipment or process type under the scope of the proposed project that creates a significant environmental impact, at least one alternative, where feasible, shall be considered from a "least harmful" perspective with regard to hazardous or toxic air pollutants. It is expected that potential energy, hazards and hazardous materials, hydrology and water quality, and solid waste impacts associated with earlier penetration of on-road and off-road fleets using alternative fuels, would be less under Alternative 1 – No Project Alternative because it would avoid significant adverse impacts to all environmental topic areas evaluated compared to the remaining alternatives. Thus, from an air toxics perspective, when compared to the proposed project and the other alternatives under consideration, if implemented, Alternative 1 is considered the lowest toxic alternative.

6.8 CONCLUSION

Of the project Alternatives, Alternative 1 would generate the least severe and fewest number of environmental impacts compared to the 2012 AQMP. However, of the project alternatives it would achieve the fewest of the project objectives, namely only project objective 7 – Update planning assumptions and the best available information such as SCAG's 2012 RTP, CARB's latest EMFAC2011 for the on-road mobile source emissions inventory, and CARB's OFF-ROAD 2011 model; 8 – Update emission inventories using 2008 as the base year and incorporate emission reductions achieved from all applicable rules and regulations and the latest demographic forecasts; and 11 – Continue to work closely with businesses and industry groups to identify the most cost-effective and efficient path to meeting clean air goals while being sensitive to their economic concerns; would not attain them as effectively as the 2012 AQMP, project objectives 4 – Continue making expeditious progress towards attaining the federal eight-hour ozone standard and demonstrate attainment of the federal one-hour ozone standard (revoked) by 2022 – 2023; 5 – Reduce population exposure to ozone through continued progress towards attaining the federal one-hour (revoked) and eight-hour ozone standards by 2022 – 2023; and 6 – Reduce nonattainment pollutants at a rate of five percent per year, or include all feasible measures and an expeditious adoption schedule, or would not achieve them at all, project objectives 1 – Reduce PM2.5 nonattainment pollutants and their precursors on an expeditious implementation schedule; 2 – Demonstrate attainment of the 24-hour PM2.5 national ambient air quality standard at the earliest possible date; 3 – Reduce population exposure to PM2.5 achieving the 24-hour PM2.5 national ambient air quality standard; 9 – Update any remaining control measures from the 2007 AQMP and incorporated into the 2012 AQMP as appropriate; and 10 – Compliance with federal contingency measure requirements.

Alternative 2 would be expected to generate equivalent impacts to the 2012 AQMP in all environmental topic areas analyzed. It would achieve all of the project objectives, but would not achieve the objectives related to reducing PM2.5 emissions as well as the 2012 AQMP because it is projected to achieve the federal 24-hour PM2.5 standard in 2017, two years later than the 2012 AQMP.

Alternative 3 has the potential to generate greater impacts than the 2012 AQMP because Alternative 3 ozone Control Measure ONRD-03 could result in accelerated penetration of approximately 5,000 additional medium-heavy-duty trucks for the years 2013 through 2017 (750 trucks per year that would be diesel or diesel-hybrids that comply with the year 2010 exhaust emission standards and 250 trucks per year that would use CNG engines for a total of 1,000 trucks per year). Similarly, Alternative 3 OFFRD-01 could result in a total of

19,344 additional repowered or replaced vehicles from the year 2014 through 2017. To the extent that these ozone control measures contribute to environmental impacts, they would be greater than environmental impacts from the 2012 as shown in Table 6-23. Consequently, Alternative 3 does meet the CEQA requirement to reduce environmental impacts compared to the proposed project.

As shown in Table 6-23, Alternative 4 would generate fewer environmental impacts or less severe impacts than the 2012 AQMP. It would achieve all but three ~~four~~ of the project objectives, objectives 4 – Continue making expeditious progress towards attaining the federal eight-hour ozone standard and demonstrate attainment of the federal one-hour ozone standard (revoked) by 2022 – 2023; 5 – Reduce population exposure to ozone through continued progress towards attaining the federal one-hour (revoked) and eight-hour ozone standards by 2022 – 2023; and 9 – Update any remaining control measures from the 2007 AQMP and incorporated into the 2012 AQMP as appropriate. As shown in the air quality Table 6-19, Alternative 4 would not be as effective as the 2012 AQMP in making expeditious progress toward attaining the federal one-hour ozone standard (revoked) or the federal eight-hour ozone standard. Similarly, because a large amount of emission reductions from the ozone control measures are from stationary sources, in addition to obtaining NOx and VOC emission reductions, they would also obtain PM emission reductions, thus, further enhancing the SCAQMD's ability, not only to attain the federal 24-hour PM2.5 standard, but to maintain the standard in the future. Similarly, since Alternative 4 focuses primarily on PM2.5 emission reductions, it would not likely be as effective as the 2012 AQMP achieving project objective 6 – Reduce nonattainment pollutants at a rate of five percent per year, or include all feasible measures and an expeditious adoption schedule.

Based on the above information, the 2012 AQMP is the most effective project that achieves the project objectives relative to environmental impacts generated.

CHAPTER 7

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Organizations and Persons Consulted

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7.1 ORGANIZATIONS AND PERSONS CONSULTED

The CEQA statues and Guidelines require that organizations and persons consulted be provided in the Final Program EIR. A number of organizations, state and local agencies, and private industry have been consulted. The following organizations and persons have provided input into this document.

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CHAPTER 8

ACRONYMS

Acronyms

8.0 ACRONYMS

ABBREVIATION	DESCRIPTION
AAs	Administering Agencies
AB	Assembly Bill
AB32	California's Global Warming Solutions Act of 2006
AB939	California Integrated Waste Management Act of 1989
AB2588	Air Toxic "Hot Spots" Information and Assessment Act
ACGIH	American Conference of Governmental Industrial Hygienists
af	acre-feet
AFV	Alternative Fuel Vehicle~~s~~
AIChE	American Institute of Chemical Engineers
ALUC	Airport Land Use Commission
AMP	Alternative Marine Power
ANPR	Advance Notice of Proposed Rulemaking
API	American Petroleum Institute
APS	Alternative Planning Strategy
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	Air Resources Board
ASTM	American Society for Testing and Materials
ATCM	Airborne Toxic Control Measure
ATCP	Air Toxics Control Plan
ATPZEVs	Advanced Technology Partial Zero-Emission Vehicles
AVL	automated vehicle location
AVR	Average Vehicle Ridership
AVTA	Advanced Vehicle Testing Activity
BACT	Best Available Control Technology
BACM	Best Available Control Measures
BARCT	Best Available Retrofit Control Technology
BART	Best Available Retrofit Technology
Basin	South Coast Air Basin
BAU	business-as-usual
BLEVE	boiling liquid expanding vapor explosion
BLM	Bureau of Land Management
BMP	Best Management Practices
BNSF	Burlington Northern Santa Fe Railway
BOD	Bio-chemical Oxygen Demand
BPTCP	Bay Protection and Toxic Clean Up Plan
Btu	British Thermal Units
Btu/hr	British Thermal Units per hour
^{o}C	Degrees Centigrade
CAA	Clean Air Act
CAAP	Clean Air Action Plan
CAFE	Corporate Average Fuel Economy
CaH2Net	California Hydrogen Highway Network

CalARP	California Accidental Release Prevention Program
CalEMA	California Emergency Management Agency
CalEPA	California Environmental Protection Agency
CalRecycle	(formerly known as the California Integrated Waste Management Board)
Caltrans	California Department of Transportation
CalOSHA	California Occupational Safety and Health Administration
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCC	California Coastal Commission
CCP	Clean Communities Plan
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDPR	California Department of Parks and Recreation
CEC	California Energy Commission
CE-CERT	College of Engineering Center for Environmental Research and Technology
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQA	California Environmental Quality Act
CFCs	Chloroflorocarbons
CFR	Code of Federal Regulations
CH_4	Methane
CHMIRS	California Hazardous Materials Incident Reporting System
CHP	California Highway Patrol
CIP	Capital Improvement Program
CIWMB	California Integrated Waste Management Board
CIWMP	Countywide Integrated Waste Management Plan
CLEEN	Continuous Lower Energy, Emissions and Noise
CM	Control Measure
CMAs	Congestion Management Agencies
CMB	Combustion Sources
CMPs	Congestion Management Programs
CMS	Congestion Management System
CMAQ	Community Multiscale Air Quality
CNEL	Community Noise Equivalent Level
CNG	Compressed Natural Gas
CNS	Central nervous system
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO2e	CO2 equivalents
COHb	Carboxyhemoglobin
CPUC	California Public Utilities Commission
CPSC	Consumer Products Safety Commission
CRA	Colorado River Aqueduct
CSI	California Solar Initiative

CTS	Coatings and Solvents
CUPA	Certified Unified Program Agency
CVRP	Clean Vehicle Rebate Pilot
CVWD	Coachella Valley Water District
CWA	Clean Water Act
CWAP	Clean Water Action Plan
CWM	Chemical Waste Management
CWMI	Chemical Waste Management Inc.
dB	decibels
dBA	decibels (A-weighted)
DC	direct current
Delta	Sacramento-San Joaquin Delta
DHS	Department of Health Services
DMC	dimethyl carbonate
DOT	Department of Transportation
DPF	Diesel Particulate Filters
DPM	Diesel Particulate Matter
DPR	Department of Pesticide Regulation
DRRP	Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (also known as the Diesel Risk Reduction Plan)
DTSC	California Department of Toxic Substances Control
DTIM	Direct Travel Impact Model
DWR	California Department of Water Resources
EAP	Emergency Action Plan
ECA	Emissions Control Area
EDMS	Emissions and Dispersion Modeling System
EFMP	Enhanced Fleet Modernization Program
EHS	Extremely Hazardous Substances
EIA	Energy Information Administration
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act of 2007
EJ	Environmental Justice
EJAG	Environmental Justice Advisory Group
EMFAC	Emission Factors Model
EMFAC 2011	2011 Emission Factors model
EMWD	Eastern Municipal Water District
EOR	Enhanced Oil Recovery
EPA	Environmental Protection Agency
EPAct	Energy Policy Act
EPCRA	Emergency Planning and Community Right-to-Know Act
ERPG	Emergency Response Planning Guideline
ERPG-2	Emergency Response Planning Guide Level 2
ERPG-3	Emergency Response Planning Guide Level 3
ESP	Electrostatic Precipitator~~s~~

EVs	Electric Vehicles
EVSE	electric vehicle supply equipment
E85	Ethanol
^{o}F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FCCU	Fluid Catalytic Cracking Unit
FCV	fuel cell vehicles
FDA	Food and Drug Administration
FDDA	four dimensional data assimilation
FEMA	Federal Emergency Management Agency
FEIR	Final Environmental Impact Report
FePo	iron phosphate
FESA	Federal Endangered Species Act
Fe_2O_3	iron oxide
FFVs	Flexible Fuel Vehicles
FHWA	Federal Highway Administration
FIP	Federal Implementation Plan
FMCSA	Federal Motor Carrier Safety Administration
FMVSS	Federal Motor Vehicle Safety Standard
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
ft^2	square feet
FUA	Fuel Use Act
FUG	Fugitive Emissions
GHG	Greenhouse Gas
GHGRP	Greenhouse Gas Reporting Program
GRAS	Generally Recognized As Safe
GVWR	gross vehicle weight rating
GWh	gigawatt hour
H_2	Hydrogen
H_2S	Hydrogen Sulfide
H_2SO_4	Sulfuric Acid
HAPs	Hazardous Air Pollutants
HCFCs	Hydrochlorofluorcarbons
HDV	Heavy Duty Vehicles
HEPA	High-Efficiency Particulate ~~Air~~Arrestor
HFCs	hydrofluorocarbons
HGS	Harbor Generating Station
HI	Hazard Index
HMTA	Hazardous Materials Transportation Act
HNO_3	Nitric Acid
HOV	High Occupancy Vehicle
hp	horsepower
HRA	Health Risk Assessment
HOT	High-Occupancy Toll

HQTAs	High Quality Transit Areas
HSC	Health and Safety Code
HUD	Housing and Urban Development
HVIP	Hybrid Vehicle Incentives Project
HWCA	Hazardous Waste Control Act
HWMP	Hazardous Waste Management Plan
IARC	International Agency for Research on Cancer
ICEs	Internal Combustion Engines
ICTA	International Center for Technology Assessment
IDLH	Immediately Dangerous to Life and Health
IGR	Intergovernmental Review
IMO	International Maritime Organization
IM	industrial maintenance
IOUs	Investor Owned Utilities
IRP	Integrated Water Resources Plan
IRWD	Irvine Ranch Water District
ITS	Intelligent Transportation Systems
kW	Kilowatt
kWh	Kilowatt Hour
^{o}K	degrees Kelvin
LAA	Los Angeles Aqueduct
LACDPW	Los Angeles County Department of Public Works
LACFD	Los Angeles County Fire Department
LACSD	Los Angeles County Sanitation Districts
LADPW	Los Angeles Department of Public Works
LADWP	Los Angeles Department of Water and Power
LAER	Lowest Achievable Emission Reduction
LAFCO	Local Agency Formation Commission
LAX	Los Angeles International Airport
LBGOD	Long Beach Gas & Oil Department
lbs	pounds
lbs/day	pounds per day
lbs/gal	pounds per gallon
lbs/hr	pounds per hour
LCFS	Low-Carbon Fuel Standard
LCP	local coastal program
LDAR	Leak Detection and Repair
LEAs	Local Enforcement Agencies
LEL	Lower Explosive Limit
LEPC	Local Emergency Planning Committee
LEV III	Low-Emission Vehicle
Leq	Equivalent Continuous Level
LID	Low Impact Development
Li-ion	lithium ion
Lmax	maximum measured noise level
LNG	Liquefied Natural Gas

LOS	Level of Service
LPG	Liquefied Petroleum Gas
LRP	Local Resources Program
LRT	light rail transit
LTCP	Long-Term Conservation Plan
LUPs	land use plans
LVP-VOC	low vapor pressure volatile organic compounds
MAF	Million acre-feet
MATES	Multiple Air Toxic Exposure Study
MATES II	Multiple Air Toxic Exposure Study II
MATES III	Multiple Air Toxic Exposure Study III
MCLs	Maximum Containment Levels
MDAB	Mojave Desert Air Basin
MECA	Manufacturer's of Emission Controls Association
MEGAN	Model of Emissions of Gases and Aerosols from Nature
MEK	methyl ethyl ketone
MeTHF	methyltetrahydrofuran
Metro	Los Angeles County Metropolitan Transit Authority
mgd	million gallons per day
mg/L	milligrams per liter
mg/m^3	milligrams per cubic meter
MIBK	methyl isobutyl ketone
MIR	Maximum Incremental Reactivity
MMTCO2e	million metric tons of carbon dioxide equivalent
MnO	manganese oxide spinel
MoO_3	molybdic anhydride
MTCO2e/year	CO2 equivalent emissions per year
MRFs	Material Recovery Facilities
MPO	Metropolitan Planning Organization
m/s	meters per second
MSDS	Material Safety Data Sheet
MSRC	Mobile Source Air Pollution Reduction Review Committee
MS4s	municipal separate storm sewer systems
MTBE	methyl tertiary butyl ether
MW	megawatts
Metropolitan	Metropolitan Water District of Southern California
MWD	Metropolitan Water District
M85	Methanol
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCA	nickel-cobalt- aluminum
NCEP	National Centers for Environmental Prediction
NCM	nickel-cobalt-manganese
NCP	National Contingency Plan
NECPA	National Energy Conservation Policy Act
NEC	National Electric Code

NESHAPS	National Emission Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NFC	National Fire Codes
NFPA	National Fire Protection Association
NHTSA	National Highway Traffic Safety Administration
NiMH	nickel-metal hydride
NIOSH	National Institute of Occupational Safety and Health
N_2	Nitrogen
N_2O	Nitrous Oxide
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NOP	Notice of Preparation
NOP/IS	Notice of Preparation/Initial Study
NOx	Nitrogen Oxide
NPS	National Park Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NS	No significant impacts
NSPS	New Source Performance Standards
O_2	Oxygen
O_3	Ozone
OCA	Off-site Consequences Analyses
OCHCA	Orange County Health Care Agency
OCS	Outer Continental Shelf
OCSD	Orange County Sanitation District
OCTA	Orange County Transportation Authority
OCWD	Orange County Water District
ODS	Ozone Depleting Substances
OEHHA	Office of Environmental Health Hazards Assessment
OES	Office of Emergency Services
OHMS	Office of Hazardous Materials Safety
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PAHs	Polynuclear Aromatic Hydrocarbons
Pb	lead
PCBF	Perchlorobenzotrifluoride
PCBTF	p-chlorobenzotrifluoride
PCE	passenger car equivalents
PD	positive displacement
PEIR	Program Environmental Impact Report
PELs	Permissible Exposure Limits
PEVs	plug-in electric vehicles
PFCs	Perfluorocarbons
PG&E	Pacific Gas & Electric
pH	potential hydrogen ion concentration
PM	Particulate Matter

PM10	particulate matter less than 10 microns equivalent aerodynamic diameter
PM2.5	particulate matter less than 2.5 microns equivalent aerodynamic diameter
POTW	Publicly Owned Treatment Works
POUs	publicly owned utilities
ppb	parts per billion
ppm	parts per million
PPV	peak particle velocity
Program EIR	Program Environmental Impact Report
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
psig	pounds per square inch (gauge)
PSM	Process Safety Management
PSU	Primers, Sealers, and Undercoaters
PTFE	Polytetrafluoroethylene
PUC	Public Utilities Commission
PURPA	Public Utility Regulatory Policies Act of 1978
PV	Photovoltaic
PVC	Polyvinyl Chloride
PZEV	Partial Zero Emission Vehicle
PX	Power Exchange
Qfs	qualifying facilities
QSA	Quantified Settlement Agreement
QVT	Qualified Vehicle Testers
RCRA	Resource Conservation and Recovery Act
RCTC	Riverside County Transportation Commission
RECLAIM	Regional Clean Air Incentives Market
RELOOC	Regional Landfill Options for Orange County
RELs	Reference Exposure Levels
RFS	Renewable Fuel Standard
RFS2	2007 Renewable Fuel Standard
RHNA	Regional Housing Needs Assessment
RMP	Risk Management Program
RMS	Root Mean Squared
ROC	Reactive Organic Compound
ROG	Reactive Organic Gas
RPS	Renewable Portfolio Standard
RQs	Reportable Quantities
RRF	Relative Response Factors
RRWG	Reactivity Research Working Group
RSPA	Research and Special Programs Administration
RTAC	Regional Targets Advisory Committee
RTC	RECLAIM Trading Credit
RTIP	Regional Transportation Implementation Plan
RTP	Regional Transportation Plan

RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy
RWQCB	Regional Water Quality Control Board
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SB	Senate Bill
SBS	sodium bisulfate
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCR	Selective Catalytic Reduction
SCRRA	Southern California Regional Rail Authority
SCS	Sustainable Communities Strategy
SCHWMA	Southern California Hazardous Waste Management Authority
SDG&E	San Diego Gas & Electric
SEL	Sound Exposure Level
SF_6	Sulfur Hexafluoride
SGVEWP	San Gabriel Valley Energy Wise Program
SIP	State Implementation Plan
SNCR	selective non-catalytic reduction
SO_2	sulfur dioxide
SO_3	Sulfur Trioxide
SoCalGas	Southern California Gas Company
SOON	Surplus Off-Road Option for NOx
SO_2	sulfur dioxide
SOx	sulfur oxide
SPCC	Spill Prevention, Control and Countermeasure
SRRE	Source Reduction and Recycling Element
SSAB	Salton Sea Air Basin
STE	solar thermal energy
STEL	short-term exposure limits
SWFPs	Solid Waste Facility Permits
SWP	State Water Project
SWMD	Solid Waste Management Division
SWMP	Storm Water Management Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Toxic Air Contaminant
TAF	Thousand Acre-Feet
TAO	Technology Advancement Office
TAZ	transportation analysis zone
TBA	tert-butyl alcohol
T-BAc	tertiary butyl acetate
TCM	Transportation Control Measure
TDM	Transportation Demand Management

TDS	Total Dissolved Solids
TEA-21	Transportation Equity Act for the 21st Century
TEUs	twenty-foot Equivalent Units
TiO_2	titanium dioxide
TLVs	Threshold Limit Values
TMCs	Transportation Management Centers
TMDLS	Total Maximum Daily Loads
tpd	tons per day
tpy	tons per year
TRI	Toxic Release Inventory
TRUs	transport refrigeration units
TSCA	Toxic Substances Control Act
TSM	Transportation Systems Management
TSS	Total Suspended Solids
TWA	time-weighted average
UCI	University of California, Irvine
UCLA	University of California, Los Angeles
UEL	upper explosive limit
UFC	Uniform Fire Code
Union Pacific	Union Pacific Railroad
U.S.	United States
USBR	United States Bureau of Reclamation
U.S. ACOE	United States Army Corps of Engineers
U.S. DOE	United States Department of Energy
U.S. DOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
U.S. FWS	United States Fish and Wildlife Service
U.S. FS	United States Forest Service
UP	Union Pacific Railroad
UST	Underground Storage Tank
UWA	Unified Watershed Assessment
V/C	Volume to Capacity Ratio
VGS	Valley Generating Station
VHD	Vehicle Hours of Delay
VHT	Vehicle Hours of Travel
VMT	Vehicle Miles Traveled
VOC	volatile organic compounds
V_2O_5	vanadium pentoxide
WBMWD	West Basin ~~Metropolitan~~ Municipal Water District
WCI	Western Climate Initiative
WDR	Waste Discharge Requirements
WGS	Wet Gas Scrubber
WO_3	tungsten trioxide
WRD	Water Replenishment District
WRF	Weather Research and Forecasting Model
ZEV	Zero-Emission Vehicle

µg/l	micrograms per liter
µg/m^3	micrograms per cubic meter
µm	micrometer or micron